CITY AND COUNTY OF DENVER
OFFICE OF THE NATIONAL WESTERN CENTER

CONTRACT NO. 201841662

Horizontal Integrated Construction Services

CONTRACT

THIS CONTRACT ("**Contract**" or "**Agreement**") is made and entered into between the **CITY AND COUNTY OF DENVER**, a municipal corporation of the State of Colorado (the "**City**"), and **HENSEL PHELPS CONSTRUCTION CO.**, a Delaware company, with its principal place of business located at 420 Sixth Avenue, Greeley, Colorado 80631 (the "**Contractor**").

1. The City and County of Denver identified a need for a qualified contractor to provide overall management, preconstruction services, site management and control services, construction services, removal, replacement and/or installation of temporary and permanent underground utilities, site excavation and backfill, bulk earthworks, temporary roads and parking areas, site remediation, permanent roads and sidewalk construction, bridge construction, rail relocation and construction, landscape/hardscape installation, and other similar site infrastructure work at work locations on and/or near the National Western Center campus (the "**Project**").

2. In accordance with Section 20-56 of the Denver Revised Municipal Code, the City advertised a RFQ and issued a RFP on February 23, 2018 for Horizontal Integrated Construction Services. Proposals were received by the Executive Director of National Western Center, who recommended that the City enter into a contract for Horizontal Integrated Construction Services with the Contractor who was the selected proposer.

3. For purposes of this Agreement the terms "**Executive Director of National Western Center**" "**Executive Director**" and "**Manager**" have the same meaning.

4. Contractor will provide overall management, preconstruction services, site management and control services, removal, replacement and/or installation of temporary and permanent underground utilities, site excavation and backfill, bulk earthworks, temporary roads and parking areas, site remediation, permanent roads and sidewalk construction, bridge construction, rail relocation and construction, landscape/hardscape installation, renovation and other similar site infrastructure work at multiple work locations on and/or near the National Western Center campus. The intent is to support City staff in order to provide these services in a timely manner with utilization of a City single point of contact for complete execution within the City. The specific work packages to be constructed are currently in various stages of design, ranging from planning/concept to final design.

5. Contractor will provide preconstruction services to programmed work packages that are not at 100% design, including constructability reviews, value engineering, scheduling,

public information, project coordination, and cost estimating to ensure the Work remains on budget and schedule. The City will bring each work package to design completion utilizing one or more separate professional service providers. Contractor will also provide site management services as required to secure, control, clear, and maintain existing properties on and/or near the NWC campus and support site wide logistics and temporary works to support the interface between concurrent event operations, Health, Safety, Security, and Environmental ("**HSSE**") mitigation requirements and public access where appropriate across the campus.

6. The Parties desire to enter into an agreement for the performance of all services and work necessary to satisfactorily complete the Project, in accordance with the terms and conditions of this Contract, executed task and work orders and all incorporated Contract Documents.

7. The Contractor represents that it is qualified to perform the services and work necessary to satisfactorily complete the Project and is ready, willing and able to perform all Project services and work in accordance with the terms and conditions of this Contract and in accordance with the Contract Documents.

8. The Contractor has agreed to perform and provide personnel for all services required to administer and implement the Project on behalf of the Office of the National Western Center and perform all tasks and work, on a task and work order basis in accordance with the terms and conditions of this Contract and the Contract Documents.

NOW THEREFORE, in consideration of the compensation to be paid the Contractor, the mutual agreements hereinafter contained, and subject to the terms hereinafter stated, it is mutually agreed as follows:

1. FORMAT

1.1 Scope of Work - General. The Project includes the overall management, preconstruction services, site management services, control services, removal, replacement and/or installation of temporary and permanent underground utilities, site excavation and backfill, bulk earthworks, temporary roads and parking areas, site remediation, permanent roads and sidewalk construction, bridge construction, rail relocation and construction, landscape/hardscape installation, renovation and other similar site infrastructure work at multiple work locations on and/or near the National Western Center campus. (the "**Horizontal Integrated Construction Services Project**" or "**Project**"). The Project includes comprehensive services including all administration, coordination, oversight, project management, supervision, quality control, quality assurance, safety oversight and inspection services necessary or required to satisfactorily complete all assigned work and to provide the City with a turn-key Project managed on a daily basis by one designated National Western Center employee. The Contractor will be responsible for coordinating the delivery of all services and work orders in a manner that will minimize costs and disruption while meeting Project delivery deadlines without interfering with other work on the site.

1.2 Task and Work Order Format. All work will be performed pursuant to written executed task and work orders. Any services provided or work performed without a fully executed written task or work order is performed at Contractor's sole risk. All tasks to be

performed and work to be done under this Contract has been divided into three categories each with its own pricing, procurement and payment provisions:

1.2.1 Type 1 - Preconstruction and Site Wide Professional Services Task Orders.

1.2.2 Type 2 - Temporary Site Work Orders.

1.2.3 Type 3 - Construction Work Orders.

1.3 City Horizontal Integrated Contract Manager. The Executive Director will designate a City Horizontal Integrated Contract Manager ("**City Contract Manager**") to administer the Contract. The City Contract Manager will report to the Program Director and act as the City's single point of contact for this Agreement. The City Contract Manager may delegate certain day-to-day duties to other City employees or consultants. However, any action requiring written approval, direction or consent by the City will not be delegated and shall remain with the Executive Director or the City Contract Manager. Contractor shall plan, staff and coordinate its activities so that the Project can be effectively managed by the City Contract Manager. The work and services required and all associated costs of implementing and staffing this Contract so that it can be effectively managed by the City's single City Contract Manager are included in Contractor's services and rates/pricing of work and task orders.

2. TYPE 1 - PRECONSTRUCTION AND SITE WIDE PROFESSIONAL SERVICES TASK ORDERS

2.1 Definition and Scope.

2.1.1 Type 1 - Preconstruction and Site Wide Professional Services Task Orders. Type 1 Task Orders will be used for all preconstruction services (to include packaging strategies for Type 2 and 3 Work Orders), cost estimating, scheduling, design/constructability reviews, utility and rail coordination, site-wide management oversight, logistics management (including interface and coordination with ongoing operations and events and site controls), public relations and/or public information, required meetings and reporting for site wide services, workforce development coordination, site-wide health, safety, security and environmental management services and related services as needed for successful delivery of the Pre-Construction Services and Site Wide Services associated with the Project. The City anticipates issuing a single Type 1 Task Order each year. If additional services are required the City will issue a Proposal Request as described below.

2.1.2 Staffing. The Contractor established a core team of Key Personnel to successfully carry out the Type 1 scope of services. The Key Personnel shall perform their specialty for all such services required by this Contract and provide regular communication with the City in terms of progress towards its completion. Contractor's Key Personnel be retained for the life of this Contract to the extent practicable and to the extent that such

services maximize the quality of work performed. Key Personnel are those individuals listed in **Exhibit B**.

2.1.2.1 The Contractor shall submit to the City Contract Manager a list of any additional key personnel who will perform work under this Agreement within thirty (30) days of this Agreement being executed, together with complete resumes and other information describing their ability to perform the tasks assigned. Such additional Key Personnel must be recommended by the Contractor and approved by the City Contract Manager before they are assigned to perform work or services under this Contract.

2.1.2.2 If the Contractor decides to replace any of its Key Personnel, the Contractor shall notify the City Contract Manager in writing of the desired change. No such changes shall be made until replacement personnel are recommended by the Contractor and approved in writing by the City Contract Manager.

2.1.3 Key Personnel. The Key Personnel will be engaged through a Type 1 Task Order for pre-construction and site wide services by a mutually agreed annual staffing plan. The key personnel:

2.1.3.1 Contractor Manager - The Contractor Manager ("**CM**") is responsible for the overall direction and management of the Project and all of the individual tasks and work assigned by the City. The CM will act as a single point of contact for the City in all matters related to the Project. All project managers for each individual project will report to the CM.

2.1.3.2 Preconstruction Manager - a Preconstruction Manager ("**PM**") responsible for all preconstruction services required. Any required engineering and technical staff report to the PM.

2.1.3.3 Health, Safety and Security Manager - The HSS Manager is responsible for implementation of the Project wide health, safety, security program, including safety oversight of all field construction activities.

2.1.3.4 Cost and Schedule Controls Manager - The Cost and Schedule Controls Manager is responsible for Project wide costs, budget, and schedule controls. Position provides Project wide oversight, review of all pay applications, and work order specific quantity sheets issued to the City. Tracks day to day progress of the work and provides regular Project wide reports to the City.

2.1.3.5 Documentation Manager - Responsible for Project records, files, correspondence, and submittals issued by subcontractors. Tracks submittals, such as prevailing wage reports, and ensures compliance for all records retention, reporting, and audit issues. Maintains the permit logs for each project and final quality documentation.

2.1.3.6 Quality Manager - The Quality Manager is responsible for oversight of Quality Control and Quality Assurance.

2.1.3.7 Environmental Compliance Manager - Responsible for who overseeing contractor's environmental compliance on the Project.

2.1.3.8 Workforce Coordinator - Responsible as the single point of contact for Workforce coordination, implementation and reporting on the Project.

2.1.3.9 Public Information Manager - a Public Information Manager ("PI") will manage the Public Information effort for the work performed to accomplish the Project.

2.1.3.10 Logistics Manager - Responsible for the coordination of the overall Project logistics and coordination for construction activity and concurrent operations.

2.2 AUTHORIZATION

2.2.1 Pricing Request and Proposal

2.2.1.1 Preconstruction and Annual Site Wide Services. Annually, and sufficiently in advance of the expiration of the prior year's Type 1 Task Order to avoid any disruption in service, Contractor will meet with the City Contract Manager and agree on a scope of services for an annual Type 1 Task Order for site wide professional and preconstruction services. Contractor will prepare a detailed pricing proposal listing specific tasks, personnel and associated estimated hours required to complete various required tasks, deliverables and schedule requirements.

2.2.1.2 Additional Site Wide and Preconstruction Services. If additional services are required, the City will issue a Proposal Request in the form attached as **Exhibit D**. Each Proposal Request will identify the needed scope of work and schedule requirements.

2.2.1.3 The City will review the Contractor's Pricing Proposal and, as necessary, perform any reconciliation, confirmation, verification and negotiation activities with the Contractor required to establish a complete understanding between the City and the Contractor. If the Proposal is ultimately acceptable to the City, the City will issue a Task Order, in the form attached as **Exhibit E**, funding and authorizing the Contractor to perform the Task in accordance with the terms and conditions of the Task Order, the Pricing Proposal, this Contract and the Contract Documents.

2.2.2 Task Order. The fully executed Task Order will authorize the services under the terms and conditions set forth therein, upon the appropriation

and encumbrance of the full amount of funds required to compensate the Contractor for the task identified in the Task Order.

2.3 COMPENSATION

2.3.1 Fully Burdened Hourly Rates. Contractor's sole compensation for Type 1 Task Orders will be payment of the hourly rates set forth in **Exhibit B** for actual hours worked by employees in the listed categories. The fully burdened rates in **Exhibit B** include all costs associated with or arising from the provision of Type 1 Services including but not limited to taxes, overhead, general conditions, benefits, consumables, office support, back office staff and reimbursable expenses.

2.3.2 Rate Escalation. Initial rates will apply until May 31, 2021. Contractor may request a rate adjustment for services provided starting June 1, 2021 and in subsequent years, by submitting a written request for approval to the Executive Director no later than May 1st of the preceding year. The cumulative increase in hourly rates in all years of this Agreement will not exceed the average annual percentage that the Bureau of Labor Statistics Consumer Price Index for All Urban Consumers for Denver-Boulder-Greeley has increased over the average of the 2018-2020 index. Such request is to be accompanied by a justification letter with support documentation. In addition; the City reserves the right to accept, reject, or negotiate the rate adjustments or timing thereof. If budgets are being capped and/or reduced, and/or City employee pay rates are frozen due to budgetary restraints, no increases will be allowed.

2.3.3 Additional Services. Type 1 Task Orders may include an additional services budget. If additional services are performed by Contractor's employees, Contractor will be paid for actual hours worked at the rates set forth in **Exhibit B.**

2.3.4 Reimbursable Expenses. Unless expressly authorized by the City as part of an approved task order or specified in **Exhibit B**, the City will not compensate the Contractor for expenses such as postage, travel, mileage, parking, telephone, copies or messenger services costs incurred in connection with the Work performed under this Agreement. Such costs are included in the hourly rates paid by the City. The inclusion of rates for expenses in a proposal attached to a task order does not authorize reimbursable expenses unless the executed task includes a not to exceed maximum amount for reimbursable expenses.

2.3.5 Type 1 Task Order Maximum. Every Type 1 Task Order will include a Task Order Maximum. The Task Order Maximum for Type 1 Task Orders will be a not to exceed maximum determined by applying the fully burdened hourly rates to a negotiated estimate of the hours required to

complete the task plus any additional services budget set forth in the Task Order.

3. TYPE 2 - TEMPORARY SITE WORK ORDERS

3.1 DEFINITION AND SCOPE

3.1.1 Type 2 Temporary Site Work Orders. Type 2 Task Orders will be issued for central office (setup, maintenance and operation); site wide control and security, noise, erosion, sediment, and dust control; site wide permits, insurance, snow removal; fencing; road maintenance; signage; traffic control, rail coordination and other site wide services ("Type 2 Work Order"). The City's preference is to issue single Type 2 Work Order each year covering all Type 2 work. If additional site wide work is required the process described below will be followed for additional site work.

3.2 AUTHORIZATION

3.2.1 Scoping and Procurement Strategy. Annually, and sufficiently in advance of the expiration of the prior year's Work Order to avoid any disruption in service, Contractor will meet with the City Contract Manager to discuss the scope of services for an annual Type 2 Work Order. Unless otherwise agreed to by the City's Contract Manager in writing all Type 2 work will be procured through advertised unit price bids.

3.2.2 Preparation of Bid / Proposal Documents. Contractor will work with the City Contract Manager to determine the most advantageous manner to package bids. Contractor will then prepare complete bid packages including time requirements, specifications, MWBE goals and requirements and estimated unit quantities (or if authorized in writing, proposal requests) for the City Contract Manager's Approval. No Type 2 Work Order will be advertised without the City Contract Manager's Approval.

3.2.3 Competitive Procurement. All Type 2 work will be competitively procured and advertised. Contractor will advertise all Type 2 work in accordance with industry standards. In addition, Contractor shall provide City with all notices of invitations to bid a minimum of three days before the advertisement date for approval. Unless the City pre-approves a different procedure in writing, Contractor must obtain a minimum of three sealed date stamped bids for all work scopes. Contractor may request written permission from the City Project Manager to submit a sealed bid for work it wants to self-perform. All bids will be opened in the presence of the City Contract Manager who will determine which bids/proposals represent the best value to the City.

3.2.4 Work Order. Contractor will then prepare a work order consisting of the accepted bids/proposals. Each work order will include a time for performance, liquidated damage amount if any, agreed to unit rates and quantities with supporting documentation, contractor's overhead and profit fee, applicable sales

and use taxes, insurance, bonds, Textura fees and a not to exceed Work Order Maximum.

3.2.5 Notice to Proceed. Following issuance of a Work Order, the City's Contract Manager shall issue a Work Order Notice to Proceed for the Project and the Contractor shall have ten (10) consecutive calendar days from the date of Notice to Proceed to commence with the Work and prosecute it to conclusion in accordance with the terms and conditions of the Work Order and the Contract Documents. Each Work Order Notice to Proceed issued will be in the form attached hereto and incorporated herein as **Exhibit I.**

3.3 COMPENSATION

3.3.1 Cost of the Work. The Cost of the Work is the sum of all accepted bids/proposal necessary to complete the Work described in the Work Order. The Cost of the Work does not include insurance, bonds, sales and use taxes or Textura fees which will be reimbursed at their actual cost to the Contractor.

3.3.2 Contractor's Management Fee – Type 2 Work Orders. Contractor's Management Fee for Type 2 Work Orders is 9.15 % ("Type 2 Fee"). Contractor's Type 2 Fee is compensation for all of Contractor's work, services, costs and general conditions associated with packaging and obtaining bids or proposals, advertising and other procurement responsibilities, work order oversite, management and salaries of all personnel necessary to manage and complete a Type 2 Work Order. Contractor is not entitled to any hourly (Type 1) compensation for these services.

3.3.3 Taxes, Insurance, Bonds, Textura Fees. Contractor will be reimbursed its actual cost of sales and use taxes, work order specific insurance coverage, bonding costs associated with the work order and work order Textura Fees.

3.3.4 Compensation -Type 2 Work Orders. The City will pay and Contractor will accept as it total compensation for properly completed work:

Cost of Completed Work + (Cost of Completed Work * Type 2 Fee) + Actual Cost of Sales and Use Taxes, Insurance, Bonds, Textura Fees = Total Compensation

3.3.5 Type 2 Work Order Maximum. The Work Order Maximum for Type 2 Work Orders is:

Cost of the Work + (Cost of Work * Type 2 Fee) + Actual Cost of Sales and Use Taxes, Insurance, Bonds, Textura Fees = Type 2 Work Order Maximum

Contractor's total compensation for completing all work required by a Type 2 - Work Order will not exceed the Type 2 Work Order

Maximum unless adjusted by Change Order pursuant to the terms of this Agreement.

4. TYPE 3 - CONSTRUCTION WORK ORDERS

4.1 DEFINITION AND SCOPE

4.1.1 Type 3 - Construction Work Orders. Type 3 Construction Work Orders will be issued for all work required to procure, construct and oversee the construction of designed permanent Project elements and temporary work necessary to accomplish Project goals ("Type 3 Work Order"). Anticipated work includes: mass earthworks and environmental cleanup required to provide pad ready developable plots, riverfront open space, utility construction and coordination, road construction and associated right of way work, rail road construction, enabling and infrastructure work including structures on or related to the Project.

4.2 AUTHORIZATION

4.2.1 Procurement Strategy. Unless otherwise agreed to by the City's Contract Manager in writing, all Type 3 work will be advertised and procured using low bid unit pricing by Contractor. The City Contract Manager may, in their sole discretion, require the use of an alternate competitive procurement method.

4.2.2 Proposal Request. The City will issue to the Contractor a Proposal Request in the form attached as **Exhibit D** ("Proposal Request"). Each Proposal Request will identify the procurement method, scope of work, schedule requirements, any liquidated damage amount, the MWBE goal for the work order and other project specific terms and conditions. Each Proposal Request will result in a final Pricing Proposal from the Contractor incorporating the final design, specifications and other requirements.

4.2.3 Preparation of Bid / Proposal Documents. Contractor will then prepare complete bid/proposal packages that include design documents, time requirements, specifications, and the MWBE goal for the City Contract Manager's Approval. No Type 3 Work Order will be advertised without the City Contract Manager's Approval.

4.2.4 Competitive Procurement. All Type 3 Work Orders will be advertised and competitively procured. Contractor will advertise all work orders in accordance with industry standards. In addition, Contractor shall provide the City with all notices of invitations to bid a minimum of three days before the advertisement date for approval and so that invitations may be posted on the City's website. For certain critical work (environmental remediation, boring, etc.) the City may require that the subcontractor performing the work be prequalified per Public Works' Rules for Prequalification of Construction Contractors. Unless the City pre-approves a different procedure in writing, Contractor must obtain a minimum of three sealed date stamped bids/proposals for all work. Contractor

may submit a sealed bid/proposal to self-performed work twenty-four (24) hours prior to the bid closing, which will be counted as one of the three required competitive bids. Bids/proposals will be opened in the presence of the City Contract Manager to ensure selection of the lowest qualified, responsible, responsive bidder or if an alternative selection process is used the proposal that represents the best value to the City. The City reserves the right to reject any subcontractor that it determines is not qualified or responsible.

4.2.5 Pricing Review. The City will review the Contractor's final Pricing Proposal and, as necessary, perform any reconciliation, confirmation, verification and negotiation activities with the Contractor required to establish a complete understanding between the City and the Contractor. Such activities shall be documented for each work order.

4.2.6 Work Order. If the City, in its sole discretion decides to proceed with the work the City will execute a Work Order, in the form attached as **Exhibit E**. Each Work Order will include a time for performance, liquidated damage amount if any, the total cost of the work with supporting documentation, contractor's Type 3 fee, work order specific: sales and use taxes, bonds, and Textura fees and a not to exceed Work Order Maximum.

4.2.7 Notice to Proceed. Following issuance of a Work Order, the City's Contract Manager shall issue a Work Order Notice to Proceed and the Contractor shall have ten (10) consecutive calendar days from the date of Notice to Proceed to commence with the Work and prosecute it to conclusion in accordance with the terms and conditions of the Work Order and the Contract Documents. Each Work Order Notice to Proceed issued will be in the form attached hereto and incorporated herein as **Exhibit I.**

4.3 PAYMENT

4.3.1 Cost of the Work. The Cost of the Work is the sum of all accepted bids/proposals necessary to complete the Work described in the Work Order. The Cost of the Work does not include work order specific insurance, bonds, sales and use taxes or Textura fees which will be reimbursed at the actual cost to the Contractor.

4.3.2 Contractor's Management Fee – Type 3 Work Orders. Contractor's Management Percentage for Type 3 Work Orders is 9.15% ("Type 3 Fee"). Contractor's Type 3 Fee is compensation for all of Contractor's work, services, costs and general conditions associated with packaging and obtaining bids or proposals, oversite, management and salaries of all personnel necessary to manage and complete a Type 3 Work Order. Contractor is not entitled to any hourly (Type 1) compensation for these services.

4.3.3 Taxes, Insurance, Bonds, Textura Fees. Contractor will be reimbursed its actual cost of sales and use taxes, work order specific insurance coverage, bonding costs and Texture Fees associated with the work order.

4.3.4 Compensation -Type 3 Work Orders. The City will pay and Contractor will accept as it total compensation for properly completed work:

Cost of Completed Work + (Cost of Completed Work * Type 3 Fee %) + Actual Cost of Sales and Use Taxes, Insurance, Bonds, Textura Fees= Total Compensation

4.3.5 Type 3 Work Order Maximum. The Work Order Maximum for Type 3 Work Orders is:

Cost of the Work + (Cost of Work * Type 3 Fee) + Actual Cost of Sales and Use Taxes, Insurance, Bonds, Textura Fees = Type 3 Work Order Maximum

Contractor's total compensation for completing all work required by a Type 2 - Work Order will not exceed the Type 3 Work Order Maximum unless adjusted by Change Order pursuant to the terms of this Agreement.

4.3.6 Lump Sum and Guaranteed Maximum Price Payment. If the City exercises its option to price a Type 3 Work Order using a GMP or Lump Sum the payment terms will be stated in the corresponding Work Order.

5. GENERAL REQUIREMENTS

5.1 Application of General Conditions to Each Work/Task Order. The City and County of Denver Standard Specifications for Construction General Contract Conditions, 2011 Edition (General Conditions), incorporated by reference and index attached as **Exhibit S,** shall apply to this Contract and all Subcontracts as if incorporated separately for the Work of each Task/Work Order issued hereunder as revised and supplemented herein. Given that under this Contract, the Contractor is to furnish all labor, tools, supplies, equipment, materials and everything necessary for and required to do, perform and complete all of the Work described in any Task/Work Order issued in accordance with the terms and conditions set forth herein, certain provisions, terms and conditions included in the General Contract Conditions either will not apply or will apply on a Work Order by Work Order basis rather than an overall Contract basis. Any variance to the applicability of the General Conditions shall be requested by the Contractor for approval by the City Contract Manager. Unless otherwise specified or clearly inapplicable from the context of a given provision, each and every General Contract Condition contained or referenced in the Contract Documents shall apply to and control all work performed hereunder on a work order by work order basis. Contractor will utilize the forms attached to this Contract (or the current versions if updated) including the Work Order Final Receipt – **Exhibit M**, Final/Partial Lien Release – **Exhibit N**, and Contractor's Certificate of Payment Form – **Exhibit O.**

5.2 Program Savings. If the final cost of any task or work order, including all task or work order changes, is less than the Task/Work Order Maximum, one hundred percent (100%) of the savings shall inure to the benefit of the City.

5.3 Compliance with Minority/Women Business Enterprise Requirements. This Contract is subject to all applicable provisions of Divisions 1 and 3 of Article III, of Chapter 28, Denver Revised Municipal Code (D.R.M.C.), designated as §§28-31 to 29-36 and 28-52 to 28-90 D.R.M.C., and referred to in this Contract as the "M/WBE Ordinance." In accordance with the requirements of the M/WBE Ordinance, Minority and Women Business Enterprise ("M/WBE") participation goals shall be met by utilization of certified MBEs or WBEs as required by §28-60(b). Section 28-60(b) provides that for contracts let in accordance with §2.3.3(A), a department head is empowered to require proposers to address the project goal by means of a Compliance Plan, as defined in the M/WBE Ordinance and as authorized by the Director of Division of Small Business Opportunity ("DSBO"). In addition to the applicable provisions of the M/WBE Ordinance, the Contractor agrees, as an express condition of its performance hereunder, to comply with the requirements of the Compliance Plan approved by the DSBO Director, attached as **Exhibit P**. Contractor working with the City Contract Manager will contact the DSBO Director before soliciting bids for Type 2 and Type 3 Work Orders, as set forth and defined in the Compliance Plan, **Exhibit P**, so that the DSBO Director can set a goal for the applicable Work Order. The goal set by the DSBO Director will be stated in the applicable Work Order and shall become a requirement of this Contract and the approved Compliance Plan. Without limiting the general applicability of the foregoing, the Contractor acknowledges its continuing duty, pursuant to §§28-72, 28-73 and 28-75, D.R.M.C. and the M/WBE Program, to meet and maintain throughout the duration of this Construction Contract its participation and compliance commitments, and to ensure that all MBE and WBE subcontractors subject to the M/WBE Ordinance or the M/WBE program also maintain such commitments and compliance. Failure to comply with these requirements may result, at the discretion of the DSBO Director, in the imposition of sanctions against the Contractor in accordance with §28-77, D.R.M.C.

5.4 Compliance with Wage Rate Requirements. Contractor shall comply with, and agrees to be bound by, all requirements, conditions and City determinations regarding the Payment of Prevailing Wages Ordinance, Sections 20-76 through 20-79, D.R.M.C. including, but not limited to, the requirement that every covered worker working on a City owned or leased building or on City-owned land shall be paid no less than the prevailing wages and fringe benefits in effect on the date the bid or request for proposal was advertised. Initial Prevailing Wage Rates attached as **Exhibit Q.** In the event a request for bids, or a request for proposal, was not advertised, Contractor shall pay every covered worker no less than the prevailing wages and fringe benefits in effect on the date funds for the contract were encumbered.

Date bid or request for qualifications/proposals was advertised February 23, 2018.

Prevailing wage and fringe rates will adjust on, and only on, the anniversary of the date the Contract was fully executed. Unless expressly provided for in this Agreement, Contractor will receive no additional compensation for increases in prevailing wages or fringe benefits. Contractor shall provide the Auditor with a list of all subcontractors providing any services under the contract. The Contractor shall provide the Auditor with electronically-certified payroll records for all covered workers employed under the contract. Contractor shall prominently post

at the work site the current prevailing wage and fringe benefit rates. The posting must inform workers that any complaints regarding the payment of prevailing wages or fringe benefits may be submitted to the Denver Auditor by calling 720-913-5000 or emailing auditor@denvergov.org. If Contractor fails to pay workers as required by the Prevailing Wage Ordinance, Contractor will not be paid until documentation of payment satisfactory to the Auditor has been provided. The City may, by written notice, suspend or terminate work if Contractor fails to pay required wages and fringe benefits.

5.5 Workforce Requirements.

5.5.1 Objectives of Pilot Program. The National Western Center is committed to developing and implementing a Pilot Workforce Program for the Horizontal Integrated Construction contract that will increase outreach, training, job opportunities and employment of people in economically disadvantaged areas and populations and address shortages in qualified construction workers.

5.5.2 Targeted Areas. "Targeted Areas" are economically disadvantaged areas of the City identified by zip code on the map attached as **Exhibit T.**

5.5.3 Targeted Populations. "Targeted Populations" are:

5.5.3.1 Veterans - A "Veteran" is any person who has served any amount of time in any branch of the United States Armed Forces.

5.5.3.2 Formerly Incarcerated Individuals – A "Formerly Incarcerated Individual" is anyone incarcerated for any amount of time because of a felony conviction.

5.5.4 Workforce Platform. The City is currently working with partners to develop a common workforce platform and program. When it is available, Contractor shall utilize the City's common workforce platform ("WorkNOW") and coordinate its workforce efforts with any supporting program.

5.5.5 Workforce Plan. Contractor's approved Workforce Plan is attached as **Exhibit _T_**. Contractor shall comply with all requirements of its approved Workforce Plan. The approved Workforce Plan shall at a minimum address:

5.5.5.1 Specific actions Contractor will take to increase outreach, training, job opportunities and employment in Target Areas and of Targeted Populations both before and after WorkNOW is available.

5.5.5.2 Contractor's commitment to coordinate and interface with a common workforce platform once it is available.

5.5.5.3 A Workforce coordinator who will be the central point of contact for workforce issues.

Periodic reporting of progress meeting specific goals consistent with the objectives of the Pilot Workforce Program including data on outreach, training, job opportunities and the employment of people living in Targeted Areas and people from Targeted Populations.

5.6 Performance and Payment Bond. A Performance and Payment Bond, in the form attached as **Exhibit F**, shall be furnished covering all work orders performed hereunder. An initial bond in the amount of $50,000,000.00 shall be provided prior to Contract Execution. As work orders are issued, causing the total dollar value of outstanding work to exceed the amount of the initial bond. Contractor shall provide the City with bond Change Riders covering the total dollar amount of outstanding work and proposed new work in the form attached as **Exhibit G.**

5.7 Insurance. General Condition 1601 is hereby deleted in its entirety and replaced with the following: The City intends to utilize a Rolling Owner Controlled Insurance Program ("**ROCIP**") for this Project. The proposed requirements for this program are attached as **Exhibit H**. Contractor shall strictly comply and insure that its subcontractors comply with the requirements of the ROCIP program as finalized. The final ROCIP requirements are hereby incorporated by reference into this Agreement. Contractor will contact the City's Risk Management Office ("Risk") before finalizing each task and work order to determine if any additional coverage at the task/work order level will be required. Contractor will provide documentation requested by Risk, including the scope of work, location where work will be performed and known projects risks so that Risk can determine what additional insurance coverages, if any, will be required for that work order. Additional coverages may include, but are not limited to, Builder's Risk or Installation Floater, Flood, Contractors Pollution Liability, Professional Liability, and/or Railroad Protective Liability Insurance. Contractor will obtain, or require that its subcontractors obtain, additional Work Order specific coverage required by Risk. Contractor will provide the City with a certificate of insurance, preferably an ACORD certificate, confirming that the required coverage, at the required limits, is in place before starting work. Certificate(s) of insurance for any additional coverage will be attached to each task/work order. Any coverage that Contractor or its subcontractors are required to purchase and any additional insurance required on a task/work order basis shall comply with the following requirements:

5.7.1 General Conditions. Contractor agrees to secure, at or before the time of execution of this Agreement, the following insurance covering all operations, goods or services provided pursuant to this Agreement. Contractor shall keep the required insurance coverage in force at all times during the term of the Agreement, or any extension thereof, during any warranty period, and for eight (8) years after termination of the Agreement. The required insurance shall be underwritten by an insurer licensed or authorized to do business in Colorado and rated by A.M. Best Company as "A-"VIII or better. Each policy shall contain a valid provision or endorsement requiring notification to the City in the event any of the required policies be canceled or non-renewed before the expiration date thereof. Such written notice shall be sent to the parties identified in the Notices section of this Agreement. Such notice shall reference the City contract number listed on the signature page of this Agreement. Said notice shall be sent thirty

(30) days prior to such cancellation or non-renewal unless due to non-payment of premiums for which notice shall be sent ten (10) days prior. If such written notice is unavailable from the insurer, contractor shall provide written notice of cancellation, non-renewal and any reduction in coverage to the parties identified in the Notices section by certified mail, return receipt requested within three (3) business days of such notice by its insurer(s) and referencing the City's contract number. If any policy is in excess of a deductible or self-insured retention, the City must be notified by the Contractor. Contractor shall be responsible for the payment of any deductible or self-insured retention. The insurance coverages specified in this Agreement are the minimum requirements, and these requirements do not lessen or limit the liability of the Contractor. The Contractor shall maintain, at its own expense, any additional kinds or amounts of insurance that it may deem necessary to cover its obligations and liabilities under this Agreement.

5.7.2 Proof of Insurance. Contractor shall provide a copy of this Agreement to its insurance agent or broker. Contractor may not commence services or work relating to the Agreement prior to placement of coverages required under this Agreement. Contractor certifies that the certificate of insurance attached as **Exhibit H**, preferably an ACORD certificate, complies with all insurance requirements of this Agreement. The City requests that the City's contract number be referenced on the Certificate. The City's acceptance of a certificate of insurance or other proof of insurance that does not comply with all insurance requirements set forth in this Agreement shall not act as a waiver of Contractor's breach of this Agreement or of any of the City's rights or remedies under this Agreement. The City's Risk Management Office may require additional proof of insurance, including but not limited to policies and endorsements.

5.7.3 Additional Insureds. For Commercial General Liability, Auto and Additional Coverage at Work Order Level Contractor and subcontractor's insurer(s) shall include the City and County of Denver and its elected and appointed officials, employees and volunteers as an additional insured.

5.7.4 Subcontractors and Subconsultants. All subcontractors and subconsultants (including independent contractors, suppliers or other entities providing goods or services required by this Agreement) shall be subject to all of the requirements herein and shall procure and maintain the same coverages required of the Contractor. Contractor shall include all such subcontractors as additional insured under its policies (with the exception of Workers' Compensation) or shall ensure that all such subcontractors and subconsultants maintain the required coverages. Contractor agrees to provide proof of insurance for all such subcontractors and subconsultants upon request by the City.

5.7.5 Additional Provisions.

5.7.5.1 For Commercial General Liability, the policies must provide the following:

5.7.5.1.1 That this Agreement is an Insured Contract under the policy;

5.7.5.1.2 Defense costs are outside the limits of liability;

5.7.5.1.3 A severability of interests or separation of insureds provision (no insured vs. insured exclusion); and

5.7.5.1.4 A provision that coverage is primary and non-contributory with other coverage or self-insurance maintained by the City.

5.7.5.2 For claims-made coverage:

5.7.5.2.1 The retroactive date must be on or before the contract date or the first date when any goods or services were provided to the City, whichever is earlier.

5.7.6 Contractor shall advise the City in the event any general aggregate or other aggregate limits are reduced below the required per occurrence limits. At their own expense, and where such general aggregate or other aggregate limits have been reduced below the required per occurrence limit, the Contractor will procure such per occurrence limits and furnish a new certificate of insurance showing such coverage is in force.

5.8 Liquidated Damages. Title 6 of the General Conditions shall apply to each work order, as supplemented by the following:

5.8.1 The Contract Time, as that term is defined under the General Conditions, shall be separately set out in each Work Order. Should the Contractor fail to complete all Work within the Contract Time allocated under that Work Order, the Contractor shall become liable to the City and County of Denver for liquidated damages on that Project, and not as a penalty, at the rate of FIVE THOUSAND DOLLARS AND ZERO CENTS ($5000.00) for each Day that the Contractor exceeds the time limits specified in each Work Order, all in accordance with provisions of General Contract Condition 602, LIQUIDATED DAMAGES; ADMINISTRATIVE COSTS; ACTUAL DAMAGES, unless a greater or lesser amount is provided for in the authorized Work Order.

5.8.2 Representative hourly rates for the City administrative costs described in General Contract Condition 602.2 shall be as follows for this Project:

Program Manager	$69/hour
Project Engineer	$63/hour
Inspector	$49/hour
Surveying, if necessary	$100/hour

5.9 Subcontracts. Title 5 of the General Conditions shall generally apply to Type 2 and Type 3 Work Orders as supplemented by the following:

5.9.1 In accordance with General Contract Condition 501, SUBCONTRACTS, no limit shall apply to that percentage of the Work which may be sublet providing that the subcontractors receive prior approval in accordance with General Contract Condition 502, SUBCONTRACTOR ACCEPTANCE.

5.10 Work Order Changes. Title 11 of the General Contract Conditions shall apply to this Contract, on a Work/Task Order by Work/Task Order basis, as supplemented by the following:

5.10.1 In accordance with the terms and conditions provided for standard change orders under Title 11 of the General Contract Conditions, the City may issue Work/Task Order Changes providing for deletions, additions and modifications to the Work under a duly issued Work/Task Order. Work/Task Order Changes must be issued on the Work/Task Order Change Form, in the form attached hereto and incorporated herein as **Exhibit J**. Contractor will be paid a Fixed Work Order Change Order Percentage Markup on the Cost of the Work of **7%** for Work Order Changes under the terms and conditions for issuance of a Change Order contained in the General Contract Conditions. Contractor will be paid at the hourly rates set forth in this Agreement for Task Order Changes. In the event that a Work/Task Order Change requires Additional Coverage at Work/Task Order Level as defined in paragraph 3.3.3.9, Contractor will be reimbursed its actual cost to purchase the Additional Coverage.

5.10.2 The Task/Work Order Change will identify any increase or decrease in the cost, change in the period of performance and any other modifications to the performance requirements for that particular Task/Work Order.

5.11 Substantial Completion. When the Contractor considers the work to be substantially complete it will request that the City inspect the work and a punch list will be developed. Upon completion of the inspection, if the City Contract Manager determines that the work is complete, a Certificate of Substantial Completion, in the form attached hereto as **Exhibit K**, will be issued by the City.

5.12 Final Completion. Upon satisfactory completion and final acceptance of each Work Order in accordance with this Contract and the General Conditions, a Work Order Final

Acceptance Notice will be issued, in the form attached hereto as **Exhibit L**. Final payment for the Work Order, including payment of all Project related retention, will be made in accordance with the Contract Documents. A Consent of Surety and a completed Work Order Final Receipt, in the form attached hereto as **Exhibit L**, must be submitted at or before the time final payment is made.

5.13 Multiple Projects. It is anticipated that multiple Work Orders will be issued and under construction at the same time and the Contractor will not be entitled to any additional compensation for performance on multiple Work Orders at the same time.

5.14 Guarantee of Work. Under the terms of this Contract, the City, in its sole discretion, will issue task and work orders and nothing contained herein shall be construed by the Contractor as promise or guarantee of any minimum amount of work, work orders or compensation hereunder.

5.15 Contract Documents. It is agreed by the parties hereto that the following list of instruments, drawings and documents which are attached hereto, bound herewith or incorporated herein by reference constitute and shall be referred to as the "Contract Documents" and all of said instruments, drawings and documents taken together as a whole constitute the Contract and Agreement between the parties hereto, and they are as fully a part of this Contract and Agreement as if they were set out verbatim and in full herein. This Contract, the Contract Documents and all subsequently issued Work Orders represent the entire and complete integration of all understandings between the City and the Contractor and supersedes all prior negotiations, representations or agreements. No prior or contemporaneous addition, deletion or other amendment hereto shall have any force or effect whatsoever, unless embodied herein in writing. No subsequent novation, renewal, addition, deletion or other amendment hereto shall have any force or effect unless embodied in a written amendatory or other agreement or change order properly executed by the parties.

Exhibit A – Contractor's Proposal dated March 21, 2018 (incorporated by reference)

Exhibit B – Key Personnel & Rates

Exhibit C- Schedule Milestones and Initial Campus Development

Exhibit D – Proposal Request Form

Exhibit E – Work and Task Order Forms

Exhibit F – Performance and Payment Bond

Exhibit G – Bond Rider Form

Exhibit H – Insurance Requirements and ROCIP Insurance Manual

Exhibit I – Task/Work Order Notice to Proceed

Exhibit J – Task/Work Order Change Form

Exhibit K – Task/Work Order Substantial Completion Notice Form

Exhibit L – Task/Work Order Final Acceptance Notice Form

Exhibit M – Work Order Final Receipt

Exhibit N – Final/Partial Lien Release Form

Exhibit O – Contractor's Certificate of Payment Form

Exhibit P – Accepted M/WBE Program Compliance Plan

Exhibit Q - Prevailing Wage Rates

Exhibit R – Rules and Regulations Regarding Equal Opportunity

Exhibit S - General Contract Conditions (incorporated by reference, Index attached)

Exhibit T – Contractor's Workforce Place and Workforce Plan Focused Outreach Map

Exhibit U – Program Health, Safety, Security and Environmental Plan and ROCIP Safety Manual

Exhibit V – Materials Management Plan

5.16 Order of Precedence. If anything in the Contract Documents is inconsistent with this Contract, this Construction Contract will govern. The order of precedence of the Contract Documents shall be as follows:

1. this Contract;
2. each fully executed Project Task/Work Order;
3. the General Contract Conditions;
4. each set of Project Specifications;
5. each set of Project Contract Drawings; and
6. all other Exhibits.

5.17 Intent and Construction. The intent of the Contract Documents is to include all terms, conditions, work items and services necessary or required for the proper execution and completion of each Work Order. The Task/Work Order and Contract Documents are complementary, and what is required by any one shall be binding as if required by all. Work items or services not covered in the Work Order or Contract Documents will be required unless they are not consistent with the Task/Work Order or Contract Documents and are not inferable from the Task/Work Order or the Contract Documents as being necessary to produce the result intended by the Task/Work Order. Anything mentioned in the Project Specifications and not shown on the Project Drawings, or shown on the Project Drawings and not mentioned in the Project Specifications for any Work Order, shall be of like effect as if shown or mentioned in

both. Words and abbreviations that have well known technical or trade meanings are used in any Work Order or the Contract Documents in accordance with such recognized meaning.

5.18 Task/Work Orders. It is contemplated by the parties that sequential Task and Work Orders with attachments, including construction documents and technical specifications will be executed and, as such, are incorporated by reference and made a part of the Contract Documents. The incorporation of such Work Orders shall be accomplished by execution and issuance of each Work Order by the City and accepted by the Contractor.

5.19 References. Where reference is made in this Construction Contract to a provision of the General Conditions or another Contract Document, the reference refers to that provision as amended or supplemented by other provisions of the Contract Documents.

5.20 Construction Specifications. Except as amended herein or in each Project Technical Specification, all Work performed under the terms of this Contract shall be governed by the applicable provisions of the following latest editions:

City and County of Denver:

Standard Specifications for Construction, GENERAL CONTRACT CONDITIONS,
2011 Edition.

Transportation Standards and Details for the Engineering Division

City and County of Denver Traffic Standard Drawings

Wastewater Management Division
– Standard Detail Drawings
– Public Works Wastewater Capital Projects Management Standard Construction Specifications

Colorado Department of Transportation:

Standard Specifications for Road and Bridge Construction
(Sections 200 through 700 of the 2011 Edition)

Federal Highway Administration:

Manual on Uniform Traffic Control Devices for Streets & Highways (MUTCD)

Building & Fire Codes:

Building Code of the City and County of Denver
(International Building Code 2009 Series, City and County of Denver Amendments 2011)

National Fire Protection Association Standards
(As referenced in the Building Code of the City and County of Denver)

The City and County of Denver documents are available for review at the Capital Projects Management Office, 201 W. Colfax Ave., Dept. 506, (5th floor), Denver, CO 80202. The *Standard Specifications for Construction*, *GENERAL CONTRACT CONDITIONS* is available at: http://www.denvergov.org/dpw_contract_admin/ContractAdministration/ContractorReferenceDocuments/tabid/440535/Default.aspx. *Transportation Standards and Details for the Engineering Division* and the Wastewater Management Division – *Standard Detail Drawings*, are available at http://www.denvergov.org.

The "*Colorado Department* of *Transportation Standard Specifications for Road and Bridge Construction"* is available for review on CDOT's website at http://www.coloradodot.info/ and can be purchased from the Colorado Department of Transportation.

The *Manual on Uniform Traffic Control Devices for Streets & Highways* is available for review at the Federal Highway Administration Website at: www.fhwa.dot.gov, The FHWA website also contains purchasing information.

5.21 General Condition 109. General condition 109 DEPUTY MANAGER is hereby deleted in its entirety and replaced with the following:

> The "Deputy Manager" means the official who reports directly to the Executive Director and exercises supervisory responsibility in the City agency defined in Title 2 herein that is responsible for the Project. The Executive Director hereby designates the City Contract Manager as the Deputy Manager for purposes of this Contract.

5.22 With reference to General Contract Condition 109, DEPUTY MANAGER and General Contract Condition 212, CITY'S CONTRACT ADMINISTRATION LINE OF AUTHORITY, the Executive Director hereby designates the City Contract Manager as the City official responsible for those certain actions and decisions designated as the responsibility of the Deputy Manager under the General Conditions and delegates to the City Contract Manager the authority necessary to undertake those responsibilities under this Contract. The Executive Director will designate a City Contract Manager in writing prior to issuing a Notice to Proceed with the initial Task or Work Order. The Executive Director may designate a new City Contract Manager at any time by providing written notice to the Contractor.

5.23 Payments to Contractors. Type 1 Task Orders shall be submitted as monthly invoices to the City Program Manager and will be paid as set forth in Paragraph 2.3 and at the rates in **Exhibit B**. Type 2 and Type 3 Work Order applications for payment shall be submitted through Textura® Corporation's Construction Management Website. Contractor recognizes and agrees that it shall be required to use the Textura Construction Payment Management System for all Type 2 and type 3 Work Orders. Contractor further agrees that, to the fullest extent possible within the CPM System, the City shall be entitled to all non-Confidential records, reports, data and other information related to the project that are available to Contractor through the CPM System, including, but not limited to, information related to Contractor and subcontractor billings. To that end, Contractor agrees that it will activate any available settings within the CPM System that are necessary to grant the City access to such non-Confidential information

related to the contract and the project. Applications for payment shall be based on the Contract Unit Prices or the approved Schedule of Values described in GC 903.1.

5.24 In accordance with General Contract Condition 902, PAYMENT PROCEDURE, the party(ies) responsible for review of all Pay Applications shall be: Designated City Horizontal Integrated Contract Manager.

5.25 In accordance with General Contract Condition 906, APPLICATIONS FOR PAYMENTS, each Application submitted shall include the following:

5.25.1 The estimate of Work completed shall be based on the approved schedule of values, unit prices, or the percent of the Work complete.

5.25.2 Each Application for Payment shall include each and every independent subcontractor's payroll information including pay dates and pay amounts.

5.25.3 The Contractor shall also submit to the Auditor and other appropriate officials of the City in a timely fashion, information required by General Contract Condition 1004, REPORTING WAGES PAID.

5.26 In accordance with General Contract condition 907, RELEASES AND CONTRACTORS CERTIFICATION OF PAYMENT, Applications for Payment must be accompanied by completed Partial or Final Claim Release Form, as appropriate, from EACH subcontractor and supplier, AND/OR the Contractors' Certification of Payment Form. The forms, Final/Partial Release and Certificate of Payment (Subcontractor/Supplier) and the Contractor's Certification of Payment, examples are attached.

5.27 Construction Inspection. General Condition 1701, CONSTRUCTION INSPECTION BY THE CITY, is modified to read in full as follows:

5.27.1 Persons who are employees of the City or who are under contract to the City will have the right to inspect and test the Work. However, any inspections by the City will not reduce or replace Contractor's QA/QC responsibilities under this Agreement. These persons may perform any tests and observe the Work to determine whether or not designs, materials used, manufacturing and construction processes and methods applied, and equipment installed satisfy the requirements of the drawings and specifications, accepted Shop Drawings, Product Data and Samples, and the General Contractor's warranties and guarantees. The General Contractor shall permit these inspectors unlimited access to the Work at no cost to the City means of safe access to the Work. In addition, General Contractor shall provide whatever access and means of access are needed to off-site facilities used to store or manufacture materials and equipment to be incorporated into the Work and shall respond to any other reasonable request to further the inspector's ability to observe or complete any tests. Such inspections shall not relieve the General Contractor of any of its quality control responsibilities or any other obligations under the Contract. All inspections and all tests conducted by the City are for the convenience and benefit of the City. These inspections and tests do not constitute acceptance of the materials or Work tested or inspected, and the City may reject

or accept any Work or materials at any time prior to the inspections pursuant to G.C. 2002, whether or not previous inspections or tests were conducted by the inspector or a City representative.

5.27.2 The Building Inspection Division will perform building code compliance inspections for structures designed for human occupancy. It is the General Contractor's responsibility to schedule and obtain these inspections. If a code compliance inspection results in identification of a condition which will be at variance to the Contract Documents, the General Contractor shall immediately notify the Program Manager and confirm such notification with formal correspondence no later than forty-eight (48) hours after the occurrence.

5.27.3 When any unit of government or political subdivision, utility or Railroad Corporation is to pay a portion of the cost of the Work, its respective representatives shall have the right to inspect the Work. This inspection shall not make any unit of government or political subdivision, utility or Railroad Corporation a party to the Contract, and shall not interfere with the rights of either party.

5.28 Disposal of Non-Hazardous Waste at DADS. In accordance with the Landfill Agreement made between the City and Waste Management of Colorado, Inc., bidders will be required to haul dedicated loads (non-hazardous entire loads of waste) to the Denver-Arapahoe Disposal Site ("DADS") for disposal. DADS is located at Highway 30 and Hampden Avenue in Arapahoe County, Colorado. The City will pay all fees associated with such disposal but the bidder shall be responsible for the costs of transporting the loads. Non-hazardous waste is defined as those substances and materials not defined or classified as hazardous by the Colorado Hazardous Waste Commission pursuant to C.R.S. §25-15-101(6), as amended from time to time, and includes construction debris, soil and asbestos. Bidders shall not use Gun Club Road between I-70 and Mississippi Avenue as a means of access to DADS.

5.29 Prohibition on Use of CCA Treated Wood Products. The use of any wood products pressure-treated with chromated copper arsenate (CCA) is prohibited. Examples of CCA-treated wood products include wood used in play structures, decks, picnic tables, landscaping timbers, fencing, patios, walkways and boardwalks.

5.30 Waiver of Part 8 of Article 20 of Title 13, Colorado Revised Statutes. The Contractor specifically waives all the provisions of Part 8 of Article 20 of Title 13, Colorado Revised Statutes regarding defects in the Work under this Construction Contract.

5.31 Attorney's Fees. Colorado Revised Statute 38-26-107 requires that in the event any person or company files a verified statement of amounts due and unpaid in connection with a claim for labor and materials supplied on this project, the City shall withhold from payments to the Contractor sufficient funds to insure the payment of any such claims. Should the City and County of Denver be made a party to any lawsuit to enforce such unpaid claims or any lawsuit arising out of or relating to such withheld funds, the Contractor agrees to pay to the City its costs and a reasonable attorney's fee which cost shall be included as a Cost of the Work.

Because the City Attorney Staff does not bill the City for legal services on an hourly basis, the Contractor agrees a reasonable fee shall be computed at the rate of one hundred dollars per hour of City Attorney time.

5.32 Greenprint Denver Requirements. In accordance with the City and County of Denver Executive Order 123: Greenprint Denver Office and Sustainability Policy, as amended, Contractor shall adhere to sections of Executive Order 123 pertinent to the construction of the built environment. This includes but is not limited to: all construction and renovation of buildings shall follow instructions and memorandum for high performance buildings; horizontal projects shall include the use of fly ash concrete and recycled aggregate where possible; and, all projects shall recycle construction and demolition waste, and install materials that contain recycled content whenever possible using the U.S. Green Building Council Leadership in Energy and Environmental Design (LEED) as guidance. Non-hazardous solid waste that is eligible for reuse or recycling is not subject to the DADS disposal requirement defined in SC-12.

A completed "Greenprint Denver Closeout Form for Construction Projects" shall be delivered to the Project Manager as a submittal requirement of Final Acceptance. http://www.denvergov.org/constructioncontracts/Home/ContractorResources/tabid/443154/Default.aspx

5.33 Intent. The parties intend herein to establish a relationship wherein the City relies upon the integrity and fidelity of the Contractor to complete each task and work order within the time and budget constraints set forth in this Contract and in a manner which satisfies the City's longstanding commitment to quality, efficiency, value, innovation, partnering, responsiveness to agency and community needs and compliance with all applicable regulatory requirements in the performance of general public improvements.

5.34 Contractor's Duties. The Contractor accepts the relationship of trust and confidence established by this Construction Contract with the City. The Contractor further agrees to utilize the Contractor's best skills, efforts, and judgment in furthering the interests of the City regarding each Project; to furnish at all times an adequate supply of qualified and competent workers and quality materials; and to perform the work in the best, most expeditious, and economical manner. Further, the Contractor agrees to furnish efficient business administration, construction management and superintendence and to use its best efforts to complete the Work of each Project in an expeditious and economical manner, consistent with the interests of the City.

5.35 Design Consultants. The City or partner entities will have separate agreements with Design Consultants to design each Project and to provide construction contract administration services necessary to ensure that the Project Work conforms to the Project Drawings and Project Specifications. Both the Contractor and the Design Consultant shall be given direction by the City, or the City's designated and authorized representative(s). The Contract Documents shall not be deemed to create any contractual relationship between the Design Consultant and the Contractor or any separate contractors, subcontractors of any tier or suppliers on each Project. The relationship between the Contractor and the Design Consultant is intended to be cooperative and proactive, with both participating on the same team with the City.

5.36 City Representatives. The Contractor shall accept the designated and authorized representatives of the City identified in the Contract Documents and perform its obligations toward and in response to such representatives in the same manner it would toward and in response to the City, pursuant to such designation and authorization.

5.37 Coordination and Cooperation.

5.37.1 The Contractor agrees to cooperate and coordinate fully with the City in its performance of the Work on each Project to meet or exceed the City's time and budgetary objectives and limitations, while maintaining the City's longstanding commitment to quality, efficiency, value, innovation, partnering, responsiveness to agency and community needs and compliance with all applicable regulatory requirements in the construction of general public improvements.

5.37.2 Compliance with the Schedule Milestones and Initial Campus Development Requirements set forth in **Exhibit C** are a requirement of the Contractor's Program Baseline Schedule to be produced and maintained as part of the Contractor's Type 1 services through a Type 1 Task Order. The requirements in **Exhibit C** shall be further defined in the Task and Work Orders issued pursuant to this Contract. It shall be a continuing requirement under this Contract for the Contractor to update Contractor's Program Baseline Schedule for all services and work that is included in the Horizontal Portfolio. The Contractor shall advise the City in writing of matters outside of the scope of this Contract that may impact the requirements set forth in **Exhibit C** and, subject to the scope of the executed Task and Work Orders, ensure the milestones and requirements in **Exhibit C** are met.

5.37.3 The Contractor shall, as a continuing work item under this Construction Contract, facilitate coordination, communication and cooperation regarding its performance hereunder between the Mayor's Office of the National Western Center consultants, partner agencies and any affiliated entities. In addition, the Contractor shall coordinate its efforts under this Construction Contract with all involved governmental and regulatory entities.

5.37.4 The Contractor shall be responsible for taking accurate and comprehensive minutes at all Project Construction meetings attended by the Contractor regarding each Project. Those minutes shall be prepared in a format approved by the City Contract Manager and issued to those parties designated by the City, no later than three working days after the meeting. Unless approved in advance in writing by each Project Manager and to the greatest extent practicable, Project meetings with the City shall be conducted in the City and County of Denver, Colorado.

5.37.5 Nothing contained in the Contract Documents shall be deemed to give any third party any claim or right of action against the City, Design Consultant or the Contractor that does not otherwise exist without regard to the Contract Documents.

5.38 Maximum Contract Amount and Term. The Maximum Contract Amount to be paid by the City to the Contractor for all Work performed under this Contract shall in no event exceed the sum of **TWO HUNDRED SEVENTY-FIVE MILLION DOLLARS AND NO CENTS ($275,000,000.00),** unless this Contract is modified to increase said amount by a duly authorized, written contract amendment mutually agreeable to and executed by the parties hereto. The term of this agreement shall be **Five (5) years** from the effective date of May 14, 2018, with an option by the City to extend the agreement for an additional two years by written amendment.

5.39 Appropriation. Notwithstanding any other term, provision, or condition herein, all payment obligations under this Contract shall be limited to the funds appropriated by the Denver City Council, paid into the Treasury of the City and encumbered for this Program. As of the date of this Contract, Zero Dollars have been appropriated and encumbered for this Contract. It is the City's intent to appropriate and encumber the funds necessary at the time it executes each Task and Work Order. The Executive Director, upon reasonable written request, will advise the Contractor in writing of the total amount of appropriated and encumbered funds that are or remain available for payment to the Contractor. Notwithstanding any other term, provision, or condition herein, all payment obligations under this Contract shall be limited to the funds appropriated by the Denver City Council, paid into the Treasury of the City and encumbered for this Contract. The City has not fully funded the budget required to complete all Project Work. The City anticipates increasing the level of funding but is under no obligation to do so. The Executive Director, upon reasonable written request, will advise the Contractor in writing of the total amount of appropriated and encumbered funds that are available for payment to the Contractor. The issuance of any form of order or directive by the City which would cause the aggregate amount payable to the Contractor to exceed the amount appropriated for the work or services to be performed in accordance with the Contract is expressly prohibited. In no event shall the issuance of any form of order or directive by the City be considered valid or binding if it requires additional compensable work or services to be performed, which performance will cause the aggregate amount payable for such performance to exceed the amount appropriated and encumbered under this Contract, unless and until such time as the Contractor has been advised in writing by the Executive Director that a lawful appropriation sufficient to cover the entire cost of such additional Work has been made. It shall be the responsibility of the Contractor to verify that the amounts already appropriated are sufficient to cover the entire cost of assigned work and services, and any work or services undertaken or performed in excess of the amount appropriated are undertaken or performed in violation of the terms of this Contract and without the proper authorization for such work or services. As such, the Contractor shall not be entitled to recover from the City any funds expended by the Contractor for such unauthorized performance.

5.40 Indemnification. Section 1602, Indemnification, of the General Conditions is applicable to this Agreement and is incorporated into this paragraph as if fully set forth herein.

5.41 No Discrimination in Employment. In connection with the performance of the Work under this Construction Contract, the Contractor agrees not to refuse to hire, discharge, promote or demote, or to discriminate in matters of compensation against any person otherwise qualified, solely because of race, color, religion, national origin, gender, gender identity, gender expression, age, military status, sexual orientation, marital status, or physical or mental disability; and the Contractor further agrees to insert the foregoing provision in all subcontracts

hereunder. Further, the Contractor agrees to comply with the provisions of Section 28-45 to 28-47, DRMC, and all Rules and Regulations promulgated and adopted by the City relating to non-discrimination in employment by contractors, subcontractors and suppliers receiving compensation for work performed pursuant to this Agreement. Rules and Regulations Regarding Equal Opportunity attached as **Exhibit R**.

5.42 Title to the Work. The parties agree that the City shall have title to all components and aspects of all work which is in place and title to all materials for which any payment has been made to the Contractor hereunder.

5.43 Applicability of Laws. This Contract and Agreement between the Contractor and the City shall be deemed to have been made in the City and County of Denver, State of Colorado and shall be subject to, governed by and interpreted and construed in accordance with the laws of the State of Colorado and the Charter, the Revised Municipal Code, Rules, Regulations, Executive Orders and fiscal rules of the City. As such, the Contractor shall at all times comply with the provisions of the Charter, Revised Municipal Code, Rules, Regulations, Executive Orders and fiscal rules of the City, and those of the State of Colorado and Federal Laws and Rules and Regulations, which in any manner limit, control or apply to the actions or operations of the Contractor, any Subcontractors, employees, agents or servants of the Contractor engaged in the Work or affecting the materials and equipment used in the performance of the Work, as the same may be, from time to time, promulgated, revised or amended. The Charter and Revised Municipal Code of the City, as the same may be amended from time to time, are hereby expressly incorporated into this Construction Contract as if fully set out herein by this reference.

5.44 Health, Safety, Security and Environmental Requirements. Contractor shall strictly comply with all requirements of the most current Program Health, Safety, Security and Environmental Plan and the site-wide Materials Management Plan. The most current versions are attached as **Exhibit U** and **Exhibit V.** Site wide professional services provided by key personnel required to comply with these documents will be compensated in a Type 1 Task Order. Site wide implementation work will be compensated by Type 2 Work Order. All other work required to implement health, safety, security and environmental requirements will be a requirement of all Type 3 Work Orders whether or not it is specifically called out in the Type 3 Work Order.

5.45 Use, Possession or Sale of Alcohol or Drugs. The Contractor shall cooperate and comply with the provisions of Executive Order 94 and its Attachment A concerning the use, possession or sale of alcohol or drugs.

5.46 Assignment Strictly Prohibited. The Contractor shall not assign or otherwise transfer, in whole or in part, any of its rights, benefits, claims, obligations, duties or entitlement to monies owed or which may become due under this Construction Contract, except upon the prior written consent and approval of the Executive Director to such assignment.

5.47 Conflict Of Interest. The parties agree that no official, officer or employee of the City shall have any personal or beneficial interest whatsoever in the services or property described herein and the City further agrees not to hire or contract for services with any official,

officer or employee of the City or any other person which would be in violation of the Denver Revised Municipal Code Chapter 2, Article IV, Code of Ethics, or Denver City Charter provisions 1.2.9 and 1.2.12.

5.48 Taxes, Charges and Penalties. Except as provided in the City's Prompt Payment ordinance, codified at DRMC Sections 20-107, 20-108 and 20-109, the City shall not be liable for the payment of any taxes, late charges, interest or penalties of any nature arising out of this Construction Contract.

5.49 Waiver of C.R.S. 13-20-802 et. seq. The Contractor specifically waives all the provisions of Part 8 of Article 20 of Title 13, Colorado Revised Statutes regarding defects in the Work under this Construction Contract.

5.50 Proprietary or Confidential Information.

5.50.1 City Information. The Contractor understands and agrees that, in performance of this Contract, the Contractor may have access to private or confidential information that may be owned or controlled by the City and that such information may contain proprietary or confidential details, the disclosure of which to third parties may be damaging to the City. The Contractor agrees that all information disclosed by the City to the Contractor shall be held in confidence and used only in performance of the Contract. The Contractor shall exercise the same standard of care to protect such information as a reasonably prudent Contractor would to protect its own proprietary data.

5.50.2 Contractor Information. The parties understand that all the material provided or produced under this Construction Contract may be subject to the Colorado Open Records Act, C.R.S. 24-72-201, et seq., and that in the event of a request to the City for disclosure of such information, the City shall advise the Contractor of such request in order to give the Contractor the opportunity to object to the disclosure of any of its proprietary or confidential material. In the event of the filing of a lawsuit to compel such disclosure, the City will tender all such material to the court for judicial determination of the issue of disclosure and the Contractor agrees to intervene in such lawsuit to protect and assert its claims of privilege against disclosure of such material. The Contractor further agrees to defend, indemnify and save and hold harmless the City, its officers, agents and employees, from any claim, damages, expense, loss or costs arising out of the Contractor's intervention to protect and assert its claims of privilege against disclosure under this Section including, but not limited to, prompt reimbursement to the City of all reasonable attorney fees, costs and damages that the City may incur directly or may be ordered to pay by such court.

5.51 Status of Contractor. It is understood and agreed that the status of the Contractor shall be that of an independent contractor retained on a contractual basis to perform work or services for limited periods of time, and it is not intended, nor shall it be construed, that the Contractor, or any member of its staff or any consultant, is an employee or officer of the City for any purpose whatsoever.

5.52 Rights And Remedies Not Waived. No payment or failure to act under the Contract by the City shall constitute a waiver of any breach of covenant or default which may then exist on the part of the Contractor. No assent, expressed or implied, by either party to any breach of the Contract shall be held to be a waiver of any default or other breach.

5.53 Notices. Any notices, demands, or other communications required or permitted to be given by any provision of this Contract shall be given in writing, delivered personally or sent by registered mail, postage prepaid and return receipt requested, addressed to the parties at the addresses set forth herein or at such other address as either party may hereafter or from time to time designate by written notice to the other party given in accordance herewith. Notice shall be considered received on the day on which such notice is actually received by the party to whom it is addressed, or the third (3rd) day after such notice is mailed, whichever is earlier. Unless changed in writing, such notices shall be mailed to:

If to the Contractor:	Hensel Phelps Construction Co. Vice President / District Manager 12121 Grant Street, Suite 410 Thornton, Colorado 80241
If to the City:	Executive Director of the Mayor's Office of the National Western Center 201 West Colfax Avenue, Dept. 205 Denver, Colorado 802020
With a copy to:	Robert Wheeler, Assistant City Attorney City and County of Denver 201 West Colfax, Department 1207 Denver, Colorado 80202

5.54 Survival of Certain Provisions. The parties understand and agree that all terms, conditions and covenants of this Contract, together with the exhibits and attachments hereto, if any, any or all of which, by reasonable implication, contemplate continued performance or compliance beyond the expiration or termination of this Contract (by expiration of the term or otherwise), shall survive such expiration or termination and shall continue to be enforceable as provided herein. Without limiting the generality of the foregoing, the Contractor's obligations for the provision of insurance, for indemnity to the City and for preserving confidentiality of trade secrets and other information shall survive for a period equal to any and all relevant statutes of limitation, plus the time necessary to fully resolve any claims, matters, or actions begun within that period.

5.55 Contract Binding. It is agreed that this Contract shall be binding on and insure to the benefit of the parties hereto, their heirs, executors, administrators, successors and duly authorized assigns.

5.56 Paragraph Headings. The captions and headings set forth herein are for convenience of reference only and shall not be construed so as to define or limit the terms and provisions hereof.

5.57 Electronic Signatures and Electronic Records. Contractor consents to the use of electronic signatures by the City. The Agreement, and any other documents requiring a signature hereunder, may be signed electronically by the City in the manner specified by the City. The Parties agree not to deny the legal effect or enforceability of the Agreement solely because it is in electronic form or because an electronic record was used in its formation. The Parties agree not to object to the admissibility of the Agreement in the form of an electronic record, or a paper copy of an electronic document, or a paper copy of a document bearing an electronic signature, on the ground that it is an electronic record or electronic signature or that it is not in its original form or is not an original.

5.58 Severability. It is understood and agreed by the parties hereto that, if any part, term, or provision of this Contract, except for the provisions of this Contract requiring prior appropriation and limiting the total amount to be paid by the City, is by the courts held to be illegal or in conflict with any law of the State of Colorado, the validity of the remaining portions or provisions shall not be affected, and the rights and obligations of the parties shall be construed and enforced as if the Contract did not contain the particular part, term or provision held to be invalid.

[ELECTRONIC SIGNATURES FOLLOW]

Contract Control Number:

IN WITNESS WHEREOF, the parties have set their hands and affixed their seals at Denver, Colorado as of

SEAL

CITY AND COUNTY OF DENVER

ATTEST:

By_____

_____

APPROVED AS TO FORM:

REGISTERED AND COUNTERSIGNED:

By_____

By_____

By_____

Contract Control Number: PWADM-201841662-00

Contractor Name: HENSEL PHELPS CONSTRUCTION CO.

By: _____

Name: Allan Bliesmer
(please print)

Title: Vice President
(please print)

ATTEST: [if required]

By: _____

Name: _____
(please print)

Title: _____
(please print)

Exhibit A – Contractor's Proposal/Response to RFP

(Dated March 21, 2018 and incorporated herein by reference only)

EXHIBIT B- KEY PERSONNEL AND RATES

Attachment 2

LIST OF KEY PERSONNEL

(Contractor may copy this page or modify it to conform to the services being offered.)

KEY PERSONNEL CLASSIFICATION (TITLE)	NAME OF INDIVIDUAL
Contract Manager	Brian Penner
Cost and Schedule Controls Manager	Jason Ingram
Preconstruction Manager	Tom Dooley
Logistics Manager	Shawn McConkey
Health, Safety, and Security Manager	Frank Visconti
Quality Manager	Kerry Gardner
Environmental Compliance Manager	Russ Cirillo, PE
Workforce Coordinator	Jocelyn Robinson
Public Information Manager	Laurie Meza
Documentation Manager	Julia Highlen

Attachment 1

CONTRACTOR PERSONNEL

CONTRACTOR Hensel Phelps Construction Co.

List ALL potential Contractor personnel titles/classification that may be utilized under the Agreement, and their respective hourly rate. Do not list names of personnel, only titles (i.e. Project Manager).

Title/Classification	Responsibilities	Rate/Hr.
Contract Manager	Single POC for all HIC Activities; collaborate with stakeholders; direct team to achieve program goals; and assign resources.	$197
Cost & Schedule Controls Manager	Manage each work order; monitor schedules, estimating, and cost; establish communication procedures; and resolve conflicts.	$156
Preconstruction Manager	Collaborate with all stakeholders; provide overall design and preconstruction coordination; and develop work plans.	$151
Quality Manager	Responsible for overall quality; manage Quality Assurance / Quality Control Managers.	$144
Logistics Manager	Establish and monitor materials management plan; develop program-wide logistics plan; and develop schedule.	$195
Health, Safety, and Security Manager	Responsible for program-wide safety; oversight of field activities; safety documentation; and POC for all competent person activities.	$125
Documentation Manager	Responsible for documentation involving cost control, submittal coordination, MEP Coordination, material deliveries, subcontractor management, negotiating changes, scheduling, and administrative duties.	$105
Project Superintendent	Responsible for daily coordination and direction of the project so that it is safe, within budget, on schedule, to the Company's quality standards and the customer's satisfaction.	$155
Area Superintendent	Responsible for safety compliance, craft supervision, subcontractor coordination, scheduling, material handling, daily reports, quality control and craft training.	$140
Schedule Engineer	Creates and maintains the Project Schedule including developing and maintaining 4-week detailed look ahead schedule as well as the CPM.	$140

The mark-up for Hensel Phelps on all subconsultant hour rates is 5%.

All reimbursable expenses are subject to the review and approval of the City. The additional expenses of the Contractor reimbursable by the City shall include:

(1) Mileage: Reimbursable at the current IRS Business Rate ONLY when Contractor is required to drive to a project located outside the City and County of Denver Boundary.

(2) Actual cost of reproducing and printing reports, drawings, specifications and other work products, and the associated cost for shipping and handling. These reimbursable expenses pertain only to requests made to the Contractor from the City, and exclude intra-office printing, scanning and reproduction required by the Contractor to complete the work.

(3) Actual cost for expendable supplies and services not normally used on a routine or normal basis in a Contractor's office (i.e. aerial photography) and which are provided especially under this Agreement for the benefit of the City.

Attachment 1

CONTRACTOR PERSONNEL

CONTRACTOR Hensel Phelps Construction Co.

List ALL potential Contractor personnel titles/classification that may be utilized under the Agreement, and their respective hourly rate. Do not list names of personnel, only titles (i.e. Project Manager).

Title/Classification	Responsibilities	Rate/Hr.
Project Engineer	Manages the Office Engineers and Jobsite Administrator. Tasks include monthly pay applications, subcontractor conflict resolution, RFIs, change orders, and schedule assistance.	$130
Senior Estimator	Develop and oversee project estimate, assists with writing bid packages, participate with subcontractor outreach and solication, and review subcontractor pricing and bid process.	$140
Lead Estimator	Supports the Senior Estimator with quantity takeoffs, solicitations, outreach and bid procurement.	$130
Estimator	Supports the Lead Estimator with quantity takeoffs, solicitations, outreach and bid procurement.	$120
Project Manager	Responsible for the safe completion of the project within budget, on schedule, to the company's quality standards and the customer's satisfaction.	$153
Safety Manager	Facilitates project-specific safety requirements, create and maintain safety management tools, maintain project safety data, participate in OSHA inspections, and conduct safety audits.	$135
Lead Quality Control Engineer	Responsible for establishing and maintaining the QC program. They interface with the Owner's QA and management on quality related issues.	$133
QC Assistant	Implements the Quality Control plan components.	$125
VDC Manager	Responsible for establishing the BIM Execution Plan, all drone activities and establishing all model development protocols.	$140
VDC Engineer	Responsible for model management and is the primary liaison for BIM coordination between the design team, the engineering team, the specialty trades and operations.	$135

The mark-up for Hensel Phelps on all subconsultant hour rates is 5%.

All reimbursable expenses are subject to the review and approval of the City. The additional expenses of the Contractor reimbursable by the City shall include:

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(3) Actual cost for expendable supplies and services not normally used on a routine or normal basis in a Contractor's office (i.e. aerial photography) and which are provided especially under this Agreement for the benefit of the City.

Attachment 1

CONTRACTOR PERSONNEL

CONTRACTOR Hensel Phelps Construction Co.

List ALL potential Contractor personnel titles/classification that may be utilized under the Agreement, and their respective hourly rate. Do not list names of personnel, only titles (i.e. Project Manager).

Title/Classification	Responsibilities	Rate/Hr.
Office Engineer	Assists the Project Engineer. Tasks may include support of the field with material management, submittals, shop drawings, deliveries, tracking of RFIs, processing of subcontractor bonds, and insurance.	$120
Field Engineer	Works directly for the Superintendents to perform layout / surveying, gather quantities of work in place, lift drawings, assist with QC, safety programs, and coordination of subcontractors material deliveries.	$115
Public Information Manager	Collaborates with the NWCO COMS Team; Public Outreach/ Information; Collaborates with Surface Transportation Boards; Develops Messaging Strategies Consistent with NWCO Goals	$165

The mark-up for Hensel Phelps on all subconsultant hour rates is 5%.

All reimbursable expenses are subject to the review and approval of the City. The additional expenses of the Contractor reimbursable by the City shall include:

(1) Mileage: Reimbursable at the current IRS Business Rate ONLY when Contractor is required to drive to a project located outside the City and County of Denver Boundary.

(2) Actual cost of reproducing and printing reports, drawings, specifications and other work products, and the associated cost for shipping and handling. These reimbursable expenses pertain only to requests made to the Contractor from the City, and exclude intra-office printing, scanning and reproduction required by the Contractor to complete the work.

(3) Actual cost for expendable supplies and services not normally used on a routine or normal basis in a Contractor's office (i.e. aerial photography) and which are provided especially under this Agreement for the benefit of the City.

Attachment 1

SUB-CONSULTANT TEAM MEMBER

FIRM NAME: Pinyon Environmental, Inc.

List ALL potential Contractor personnel titles/classification that may be utilized under the Agreement, and their respective hourly rate. Do not list names of personnel, only titles (i.e. Project Manager).

Title/Classification	Responsibilities	Rate/Hr.
Principal/Executive Management	Responsible for providing strategic direction, vision, and leadership. Performs senior-level QA/QC and conducts meetings and negotiations with regulatory and oversight agencies.	$220
Senior Engineer/ Scientist	Responsible for technical completeness and competency of all submissions and work performed, including performance of junior- and mid-level planners and scientists.	$201
Project Manager II	Project management, including coordination of multi-disciplinary teams, preparing responses to agency questions, and facilitates project meetings with client and regulators.	$179
Project Specialist/ Environmental Compliance Manager	Directs the gathering of data and prepares complex reporting and analysis. Oversight of technical products and development of detailed studies related to NEPA, air quality, noise, environmental justice, biology, geology, etc.	$153
Project Engineer/ Specialist	Conducts data analysis and input, field data gathering, miscellaneous field services related to engineering, NEPA, air quality, noise, geology, etc.	$127
Staff II Engineer/ Scientist	Conducts the collection and initial interpretation of scientific data, such as soil logging, soil and groundwater sampling, water-level surveying, scientific data, noise or air measurements.	$117
Staff I Technician/ Project Assistant	Data management and administrative support, maintain field equipment; administrative contract control.	$94
Drafting (Graphics)	AutoCAD, floor plans, elevations, sections, scale drawings, layering and concept design for architects and engineers.	$98
Field Technician/ Project Assistant	Maintain Field Equipment, Data Management	$86
Clerical	Word Processing, Clerical	$67

All reimbursable expenses are subject to the review and approval of the City. The additional expenses of the Contractor reimbursable by the City shall include:

(1) Mileage: Reimbursable at the current IRS Business Rate ONLY when Contractor is required to drive to a project located outside the City and County of Denver Boundary.

(2) Actual cost of reproducing and printing reports, drawings, specifications and other work products, and the associated cost for shipping and handling. These reimbursable expenses pertain only to requests made to the Contractor from the City, and exclude intra-office printing, scanning and reproduction required by the Contractor to complete the work.

(3) Actual cost for expendable supplies and services not normally used on a routine or normal basis in a Contractor's office (i.e. aerial photography) and which are provided especially under this Agreement for the benefit of the City.

Attachment 1

SUB-CONSULTANT TEAM MEMBER

FIRM NAME: Communication Infrastructure Group (CIG)

List ALL potential Contractor personnel titles/classification that may be utilized under the Agreement, and their respective hourly rate. Do not list names of personnel, only titles (i.e. Project Manager).

Title/Classification	Responsibilities	Rate/Hr.
Principal	Principal	$215
Senior Counselor	Executive oversight	$195
Senior Strategic Director	Senior strategic oversight	$190
Counselor	Senior oversight	$150
Chief Creative Officer	Executive oversight of all design	$195
Account Supervisor	Mid to senior oversight	$135
Senior Associate	Mid level oversight (day-to-day coordination)	$120
Associate	Mid to junior level support	$95
Graphic Designer	Graphic design of all collateral	$95
Specialist	Junior level support	$68

All reimbursable expenses are subject to the review and approval of the City. The additional expenses of the Contractor reimbursable by the City shall include:

(1) Mileage: Reimbursable at the current IRS Business Rate ONLY when Contractor is required to drive to a project located outside the City and County of Denver Boundary.

(2) Actual cost of reproducing and printing reports, drawings, specifications and other work products, and the associated cost for shipping and handling. These reimbursable expenses pertain only to requests made to the Contractor from the City, and exclude intra-office printing, scanning and reproduction required by the Contractor to complete the work.

(3) Actual cost for expendable supplies and services not normally used on a routine or normal basis in a Contractor's office (i.e. aerial photography) and which are provided especially under this Agreement for the benefit of the City.

Attachment 1

SUB-CONSULTANT TEAM MEMBER

FIRM NAME: Communication Connections Consulting

List ALL potential Contractor personnel titles/classification that may be utilized under the Agreement, and their respective hourly rate. Do not list names of personnel, only titles (i.e. Project Manager).

Title/Classification	Responsibilities	Rate/Hr.
Workforce Coordinator	Collaborate with neighbors; establish workforce plan; assist in industry/MWBE Outreach and Participation; progress reporting	$103
Workforce Lead	Manages Workforce Development/MWBE Outreach and Participation, Reporting	$103
Workforce Assistant	Administrative assistance to Workforce Coordinator and Lead. Coordination of events, i.e. venue, catering, registration, etc.	$75

All reimbursable expenses are subject to the review and approval of the City. The additional expenses of the Contractor reimbursable by the City shall include:

(1) Mileage: Reimbursable at the current IRS Business Rate ONLY when Contractor is required to drive to a project located outside the City and County of Denver Boundary.

(2) Actual cost of reproducing and printing reports, drawings, specifications and other work products, and the associated cost for shipping and handling. These reimbursable expenses pertain only to requests made to the Contractor from the City, and exclude intra-office printing, scanning and reproduction required by the Contractor to complete the work.

(3) Actual cost for expendable supplies and services not normally used on a routine or normal basis in a Contractor's office (i.e. aerial photography) and which are provided especially under this Agreement for the benefit of the City.

EXHIBIT C

SCHEDULE MILESTONES AND INITIAL CAMPUS DEVELOPMENT

EXHIBIT C- SCHEDULE MILESTONES AND INITIAL CAMPUS DEVELOPMENT REQUIREMENTS

THIS EXHIBIT IS SUBJECT TO THE TERMS AND CONDITIONS OF THE CONTRACT AND FUTURE WORK ORDERS.

A. REQUIREMENTS FOR INITIAL CAMPUS DEVELOPMENT- SCHEDULE

1. National Western Center Framework Agreement Section 7(c):

   ii. (c) Requirements for Initial Campus Development; Schedule:

   All Initial Campus Development shall be (i) consistent with the Planning Documents; (ii) completed in accordance with the Initial Campus Development Schedule; (iii) subject to the review and approval of the SteerCom; (iv) conducted so as to minimize interference with the continued operation of the National Western Stock Show during its traditional dates and times, and to minimize interference with other annual events managed or run by the WSSA to the extent reasonably possible; (v) coordinated with CSU to minimize interference with the construction and operation of the CSU Facilities and programs to the extent reasonably possible; (vi) conducted to provide the CSU Parcels to CSU in Pad-Ready Condition in accordance with Section 6(e)(iv); and (vii) conducted in a good and workmanlike manner to standards consistent with other buildings and facilities constructed for City use. The Initial Campus Development Schedule, and the Baseline Schedule from which it is derived, may be revised from time to time by SteerCom, provided that SteerCom may not extend any dates for completion of Campus Facilities beyond those dates required for completion of such facilities by the RTA Resolution without the written approval of the WSSA and CSU.

B. SCHEDULE MILESTONES

1. Specific CSU and WSSA Schedule Milestone Requirement:

   i. Unless the Initial Campus Development Schedule is revised by SteerCom, the following CSU buildings must be delivered in "pad-ready condition" on the following dates:

   - Water Resources Center, October 1, 2019
   - Equine Sports Medicine Facility, June 1, 2020

   ii. If an agreement can be reached between the City and the WSSA, the Legacy Building must be delivered in pad-ready condition.

2. Specific Capital Build Phase 1 and Phase 2 Schedule Milestone Requirement:

Schedule Milestones as listed in the Initial Campus Development Schedule to enable the subsequent Phase 1 and Phase 2 Capital Build Facilities as issued in specific Work Orders.

PAD-READY BUILDING SITES

What building sites must be delivered by the City in "pad-ready condition"?

- **Colorado State University:**
  - Water Resources Center
  - Equine Sports Medicine Facility

- **Western Stock Show Association:**
  - If an agreement can be reached between the City and the WSSA, the Legacy Building must be delivered in pad-ready condition.

What is "pad-ready condition"?

Pad-ready condition means at a minimum, at the time of conveyance of a parcel, the following with specific requirements further defined on a Work Order by Work Order Basis:

- For below existing structure footprints only, completion of abatement and demolition of above ground existing structures, including excavation and removal of foundation obstructions four (4) feet below existing ground level, backfilled, and compacted with suitable material (or two (2) feet below basement level if existing basement exists).
- Removal of existing in-use underground utilities to the edge of the parcel or to the utility main as required by the specific utility. Existing utilities shall be cut and capped in a condition that may permit temporary use during construction.
- Completion of site clearance, specifically, removal of existing site surfacing and site appurtenances as appropriate to the agreed parcel boundary.
- Bulk earthworks and associated grading to agreed sub grade level.
- Completion of environmental site cleanup to support future land use.
- Provision and maintenance of site access as agreed by separate agreement between the City and the purchaser.
- Provision of temporary water supply, sanitary connection, and electricity connections to support construction at the point of conveyance.
- Provision of permanent utilities to the agreed parcel boundary location no later than six (6) months prior to substantial completion of planned construction (as coordinated by SteerCom) associated with the City's site wide infrastructure improvements along public rights-of-way.
- Provision of perimeter sidewalks, bike paths, street lighting, landscaping, etc. associated with the City's site wide infrastructure improvements along public rights-of-way.

Exhibit D – Proposal Request Form

DENVER
THE MILE HIGH CITY

Proposal Request

The Mayor's Office of the
National Western Center
201 W. Colfax Dept. 205
Denver, CO 80202
www.nationalwesterncenter.com

[Instructions: Modify all standard highlighted text. Delete italic highlighted text prior to issuing]

Horizontal Integrated Construction Services Contract
Master Contract #_____

Type 1 Task Order; or Type 2 or Type 3 Work Order
PROPOSAL REQUEST No._____

WORK ORDER NAME or PROJECT NAME

DATE ISSUED:
[Date]

PROPOSAL DUE DATE:
[Date]

NWCO PROJECT MANAGER

[Name]

[Phone]

[Email]

BID SUBMITTAL

Email proposals in PDF format to the Project Manager by the Proposal Due Date stated above.

PROJECT DESCRIPTION

The Mayor's Office of the National Western Center is requesting that your firm submit a proposal or itemized quotation for the work described below. Include all costs, time necessary to perform the described work, and the M/WBE Participation (Type 2 and Type 3 ONLY) percentage of work on the Proposal Pricing Worksheet.

This is not a change order, field change order or notice to proceed with the work described below.

The purpose of this project is [General Project or Work Order Goals].

Description of Scope of Services or Work:

DENVER
THE MILE HIGH CITY

Proposal Request

The Mayor's Office of the
National Western Center
201 W. Colfax Dept. 205
Denver, CO 80202
www.nationalwesterncenter.com

PROPOSAL GUIDELINES

Include all Work Order Specific Proposal Guidelines here

PROJECT SCOPE AND DELIVERABLES

Include all Work Order Specific Scope and Deliverables here

PROJECT SCHEDULE

Based on the *anticipoted* **[date]** issuance of Notice to Proceed, the duration of this Work Order shall be [Work Order Term Length]

PROPOSAL EVALUATION CRITERIA

Include all Work Order Specific Proposal Guidelines here

All work shall be performed under Master Contract No._____

Liquidated Damages for this Project will be $_____ per day.

If you have any questions with the development of this Proposal Request, please contact the Project Manager with the NWCO whose contact information is listed at the top of this proposal request.

Issued By:_____
NWCO

Exhibit E - Work Order & Task Order Form

DENVER
THE MILE HIGH CITY

Horizontal Integrated Construction
Task Order

Contractor: _____

Task Order Name: _____ Vendor ID: 0000000000

Project Manager: _____ Master Contract No.: 0

Encumbrance No.: _____ Task Order No.: 0 _____

When this TASK ORDER has been signed by the approving parties, the work described in the consultant's proposal, without changing the terms of the Master Contract except as herein stipulated and agreed:

EXAMPLE

This sum, as indicated below, constitutes full and complete consideration, payment and satisfaction to the Contractor for the above described scope of work, and the contractor hereby agrees to make no further claims, demands, or requests of any kind whatsoever for further moneys, extensions of time or other consideration for the above described scope of work to the contract.

THE CONTRACTOR AGREES to furnish all material and labor and perform all work required to complete the above described work in accordance with requirements for similar work covered by the task order, except as otherwise stipulated herein, for the following considerations:

The Sum of: $0.00

Duration: 0

Accepted by Contractor: **Title:** **Date:**

MASTER CONTRACT SUMMARY	
Sum of previous work orders/changes:	$-
This task order:	$ -
Sum of all Task Orders:	$ -
Maximum contract amount:	
Contract capacity:	$ -

Approved -Executive Director Date

Approved -Department Director Date

Approved -Portfolio Manager Date

Approved -User Agency Date

Approved -Project Supervisor Date

Approved -Project Manager Date

NOTE: No person shall authorize or perform any of the above work until the task order has all signatures and has been distributed. Distribution: Prevailing Wage: AUDPWPayRequest@denvergov.org; DSBO@ci.denver.co.us; Project manager email, Using Agency and pw.contracts@denvergov.org (for pre-encumbrance).

Exhibit E - Work Order & Task Order Form (con't)

DENVER
THE MILE HIGH CITY

Horizontal Integrated Construction
WORK ORDER

Contractor: _____

Work Order Name: _____ Vendor ID: 0000000000

Project Manager: _____ Master Contract No.: 0

Encumbrance No.: _____ Work Order No.: 0

It is hereby mutually agreed that when this WORK ORDER has been signed by the contracting parties, the following described work order shall be executed by the contractor without changing the terms of the Contract except as herein stipulated and agreed:

EXAMPLE

This sum, as indicated below, constitutes full and complete consideration, payment and satisfaction to the Contractor for the above described scope of work, and the contractor hereby agrees to make no further claims, demands, or requests of any kind whatsoever for further moneys, extensions of time or other consideration for the above described scope of work to the contract.

THE CONTRACTOR AGREES to furnish all material and labor and perform all work required to complete the above described work in accordance with requirements for similar work covered by the work order, except as otherwise stipulated herein, for the following considerations:

The Sum of: $0.00

Duration: 0

Accepted by Contractor: **Title:** **Date:**

0

MASTER CONTRACT SUMMARY

Sum of previous work orders/changes:	$-
This work order:	$ -
Sum of all Work Orders:	$ -
Maximum contract amount:	
Contract capacity:	$ -

Approved -Executive Director Date

Approved -City Attorney Date

Approved -Department Director Date

Approved -Portfolio Manager Date

Approved -User Agency Date

Approved -Project Supervisor Date

Approved -Project Manager Date

NOTE: No person shall authorize or perform any of the above work until the work order has all signatures and has been distributed. Distribution: Prevailing Wage: AUDPWPayRequest@denvergov.org; DSBO@ci.denver.co.us; Project manager email, Using Agency and pw.contracts@denvergov.org (for pre-encumbrance).

Bond No. 106878876

Exhibit F – Payment and Performance Bond

CITY AND COUNTY OF DENVER
DEPARTMENT OF PUBLIC WORKS
PERFORMANCE AND PAYMENT BOND

KNOW ALL MEN BY THESE PRESENTS, that we, the undersigned Hensel Phelps Construction Co., a general partnership organized and existing under and by virtue of the laws of the State of Delaware, hereafter referred to as the "Contractor", and Travelers Casualty and Surety Company, a corporation organized and existing under and by virtue of the laws of the State of Connecticut

and authorized to transact business in the State of Colorado, as Surety, are held and firmly bound unto the CITY AND COUNTY OF DENVER, a municipal corporation of the State of Colorado, hereinafter referred to as the "City", in the penal sum of Fifty Million and No/100 Dollars ($50,000,000.00), lawful money of the United States of America, for the payment of which sum, well and truly to be made, we bind ourselves and our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents;

THE CONDITION OF THE FOREGOING OBLIGATION IS SUCH THAT:

WHEREAS, the above bounden Contractor has entered into a written contract with the aforesaid City for furnishing all labor and tools, supplies, equipment, superintendence, materials and everything necessary for and required to do, perform and complete the construction of **CONTRACT NO. 201841662 NATIONAL WESTERN CENTER HORIZONTAL INTEGRATED CONSTRUCTION SERVICES,** Denver, Colorado, and has bound itself to complete the project within the time or times specified or pay liquidated damages, all as designated, defined and described in the said Contract and Conditions thereof, and in accordance with the Plans and Technical Specifications therefore, a copy of said Contract being made a part hereof;

NOW, THEREFORE, if the said Contractor shall and will, in all particulars well and truly and faithfully observe, perform and abide by each and every Covenant, Condition and part of said Contract, and the Conditions, Technical Specifications, Plans, and other Contract Documents thereto attached, or by reference made a part thereof and any alterations in and additions thereto, according to the true intent and meaning in such case, then this obligation shall be and become null and void; otherwise, it shall remain in full force and effect;

PROVIDED FURTHER, that if the said Contractor shall satisfy all claims and demands incurred by the Contractor in the performance of said Contract, and shall fully indemnify and save harmless the City from all damages, claims, demands, expense and charge of every kind (including claims of patent infringement) arising from any act, omission, or neglect of said Contractor, its agents, or employees with relation to said work; and shall fully reimburse and repay to the City all costs, damages, and expenses which it may incur in making good any default based upon the failure of the Contractor to fulfill its obligation to furnish maintenance, repairs or replacements for the full guarantee period provided in the Contract Documents, then this obligation shall be null and void; otherwise it shall remain in full force and effect;

PROVIDED FURTHER, that if said Contractor shall at all times promptly make payments of all amounts lawfully due to all persons supplying or furnishing it or its subcontractors with labor and materials, rental machinery, tools or equipment used or performed in the prosecution of work provided for in the above Contract and that if the Contractor will indemnify and save harmless the City for the extent of any and all payments in connection with the carrying out of such Contract, then this obligation shall be null and void; otherwise it shall remain in full force and effect;

PROVIDED FURTHER, that if the said Contractor fails to duly pay for any labor, materials, team hire, sustenance, provisions, provender, gasoline, lubricating oils, fuel oils, grease, coal, or any other supplies or materials used or consumed by said Contractor or its subcontractors in performance of the work contracted to be done, or fails to pay any person who supplies rental machinery, tools or equipment, all amounts due as the result of the use of such machinery, tools or equipment in the prosecution of the work, the Surety will pay the same in any amount not exceeding the amount of this obligation, together with interest as provided by law;

PROVIDED FURTHER, that the said Surety, for value received, hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the Contract, or to contracts with others in connection with this project, or the work to be performed thereunder, or the Technical Specifications and Plans accompanying the same, shall in any way affect its obligation on this bond and it does hereby waive notice of any change, extension of time, alteration or addition to the terms of the Contract, or contracts, or to the work, or to the Technical Specifications and Plans.

IN WITNESS WHEREOF, said Contractor and said Surety have executed these presents as of this 7 day of MAY, 2018.

Attest:

Secretary

Hensel Phelps Construction Co.

Contractor

By: _____

Vice **President**

AB

Travelers Casualty and Surety Company

Surety

By: Kelly T. Urwiller

Attorney-In-Fact Kelly T. Urwiller

(Accompany this bond with Attorney-in-Fact's authority from the Surety to execute bond, certified to include the date of the bond).

APPROVED AS TO FORM:

Attorney for the City and County of Denver

By: _____

Robert Wheeler

Assistant City Attorney

APPROVED FOR THE CITY AND COUNTY OF DENVER

By: _____

Mayor

By: _____

Exec. Director of Public Works

TRAVELERS

Travelers Casualty and Surety Company of America
Travelers Casualty and Surety Company
St. Paul Fire and Marine Insurance Company

POWER OF ATTORNEY

KNOW ALL MEN BY THESE PRESENTS: That Travelers Casualty and Surety Company of America, Travelers Casualty and Surety Company, and St. Paul Fire and Marine Insurance Company are corporations duly organized under the laws of the State of Connecticut (herein collectively called the "Companies"), and that the Companies do hereby make, constitute and appoint **Kelly T. Urwiller, of Greeley, Colorado**, their true and lawful Attorney-in-Fact to sign, execute, seal and acknowledge any and all bonds, recognizances, conditional undertakings and other writings obligatory in the nature thereof on behalf of the Companies in their business of guaranteeing the fidelity of persons, guaranteeing the performance of contracts and executing or guaranteeing bonds and undertakings required or permitted in any actions or proceedings allowed by law.

IN WITNESS WHEREOF, the Companies have caused this instrument to be signed, and their corporate seals to be hereto affixed, this **3rd** day of **February, 2017.**

State of Connecticut

City of Hartford ss.

By: _____
Robert L. Raney, Senior Vice President

On this the **3rd** day of **February, 2017**, before me personally appeared **Robert L. Raney**, who acknowledged himself to be the Senior Vice President of Travelers Casualty and Surety Company of America, Travelers Casualty and Surety Company, and St. Paul Fire and Marine Insurance Company, and that he, as such, being authorized so to do, executed the foregoing instrument for the purposes therein contained by signing on behalf of the corporations by himself as a duly authorized officer.

In Witness Whereof, I hereunto set my hand and official seal.

My Commission expires the **30th** day of **June, 2021**

Marie C Tetreault
Marie C. Tetreault, Notary Public

This Power of Attorney is granted under and by the authority of the following resolutions adopted by the Boards of Directors of Travelers Casualty and Surety Company of America, Travelers Casualty and Surety Company, and St. Paul Fire and Marine Insurance Company, which resolutions are now in full force and effect, reading as follows:

RESOLVED, that the Chairman, the President, any Vice Chairman, any Executive Vice President, any Senior Vice President, any Vice President, any Second Vice President, the Treasurer, any Assistant Treasurer, the Corporate Secretary or any Assistant Secretary may appoint Attorneys-in-Fact and Agents to act for and on behalf of the Company and may give such appointee such authority as his or her certificate of authority may prescribe to sign with the Company's name and seal with the Company's seal bonds, recognizances, contracts of indemnity, and other writings obligatory in the nature of a bond, recognizance, or conditional undertaking, and any of said officers or the Board of Directors at any time may remove any such appointee and revoke the power given him or her; and it is

FURTHER RESOLVED, that the Chairman, the President, any Vice Chairman, any Executive Vice President, any Senior Vice President or any Vice President may delegate all or any part of the foregoing authority to one or more officers or employees of this Company, provided that each such delegation is in writing and a copy thereof is filed in the office of the Secretary; and it is

FURTHER RESOLVED, that any bond, recognizance, contract of indemnity, or writing obligatory in the nature of a bond, recognizance, or conditional undertaking shall be valid and binding upon the Company when (a) signed by the President, any Vice Chairman, any Executive Vice President, any Senior Vice President or any Vice President, any Second Vice President, the Treasurer, any Assistant Treasurer, the Corporate Secretary or any Assistant Secretary and duly attested and sealed with the Company's seal by a Secretary or Assistant Secretary; or (b) duly executed (under seal, if required) by one or more Attorneys-in-Fact and Agents pursuant to the power prescribed in his or her certificate or their certificates of authority or by one or more Company officers pursuant to a written delegation of authority; and it is

FURTHER RESOLVED, that the signature of each of the following officers: President, any Executive Vice President, any Senior Vice President, any Vice President, any Assistant Vice President, any Secretary, any Assistant Secretary, and the seal of the Company may be affixed by facsimile to any Power of Attorney or to any certificate relating thereto appointing Resident Vice Presidents, Resident Assistant Secretaries or Attorneys-in-Fact for purposes only of executing and attesting bonds and undertakings and other writings obligatory in the nature thereof, and any such Power of Attorney or certificate bearing such facsimile signature or facsimile seal shall be valid and binding upon the Company and any such power so executed and certified by such facsimile signature and facsimile seal shall be valid and binding on the Company in the future with respect to any bond or understanding to which it is attached.

I, **Kevin E. Hughes**, the undersigned, Assistant Secretary of Travelers Casualty and Surety Company of America, Travelers Casualty and Surety Company, and St. Paul Fire and Marine Insurance Company, do hereby certify that the above and foregoing is a true and correct copy of the Power of Attorney executed by said Companies, which remains in full force and effect.

Dated this 7 day of MAY, 2018.

Kevin E. Hughes, Assistant Secretary

To verify the authenticity of this Power of Attorney, please call us at 1-800-421-3880.
Please refer to the above-named Attorney-in-Fact and the details of the bond to which the power is attached.

Exhibit G – Bond Rider

RIDER

Work Order No. _____ **Contract No.** _____

TO BE ATTACHED TO AND FORM PART OF

PERFORMANCE AND PAYMENT (TYPE OF BOND) NO: _____

IN FAVOR OF: CITY AND COUNTY OF DENVER (OBLIGEE)

ON BEHALF OF: _____ (PRINCIPAL)

EFFECTIVE: _____ (ORIGINAL EFFECTIVE DATE)

IT IS AGREED THAT, in consideration of the original premium charged for this bond, and any additional premium that may be properly chargeable as a result of this rider,

The Surety, _____, hereby gives is consent to:

( ) INCREASE BOND PENALTY
( ) DECREASE BOND PENALTY
( ) CHANGE THE EFFECTIVE DATE
( ) CHANGE THE NAME OF PRINCIPAL
( ) CHANGE THE ADDRESS OF THE PRINCIPAL
( ) CHANGE THE EXPIRATION DATE
( ) OTHER: _____

of the attached bond as described herein:

		NO.	AMOUNT ($)
R1	WORK ORDERS / CHANGES ASSIGNED TO DATE		
R2	WORK ORDERS / CHANGES COMPLETED TO DATE **		
R3	PREVIOUS CURRENT WORK ORDER TOTAL (R1 – R2)		
R4	AMOUNT OF THIS WORK ORDER		
R5	NEW CURRENT WORK ORDER TOTAL (R3 + R4)		

PROVIDED, however, that the attached bond shall be subject to all its agreements, limitations, and conditions except as herein expressly modified, and that the liability of the Surety under the attached bond as changed by this rider shall not be cumulative. ** Note that in order for work orders to be considered "completed" and therefore removed from the "current" work order total, the City must have issued a Letter of Final Acceptance for each completed work order.

SIGNED AND SEALED THIS _____ DAY OF _____ 20__.

INSURANCE COMPANY: _____

_____ (witness)

By: _____ (Attorney-in-Fact) (Seal)

ACCEPTED BY OBLIGEE

_____ (witness)

By: _____

EXHIBIT H

INSURANCE REQUIREMENTS AND ROCIP INSURANCE MANUAL

CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY): 4/20/2018

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER	CONTACT NAME: Rebekkah McGuire	
Flood and Peterson PO Box 578 Greeley CO 80632	PHONE (A/C, No, Ext): (970) 356-0123	FAX (A/C, No): (970) 330-1867
	E-MAIL ADDRESS: RMcGuire@FloodPeterson.com	

INSURED	INSURER(S) AFFORDING COVERAGE	NAIC #
Hensel Phelps Construction Co. Plains District 12121 Grant Street; Suite 410 Thornton CO 80241	INSURER A : Zurich American Insurance Company	16535
	INSURER B : American Guarantee and Liability	26247
	INSURER C : Steadfast Insurance Company	26387
	INSURER D : XL Insurance America, Inc.	24554
	INSURER E :	
	INSURER F :	

COVERAGES **CERTIFICATE NUMBER:** CL17102520135 **REVISION NUMBER:**

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADDL INSD	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS		
A	X COMMERCIAL GENERAL LIABILITY CLAIMS-MADE X OCCUR GEN'L AGGREGATE LIMIT APPLIES PER: POLICY X PRO-JECT LOC OTHER:			GL0369726413	1/1/2018	1/1/2019	EACH OCCURRENCE DAMAGE TO RENTED PREMISES (Ea occurrence) MED EXP (Any one person) PERSONAL & ADV INJURY GENERAL AGGREGATE PRODUCTS - COMP/OP AGG	$ $ $ $ $ $	5,000,000 300,000 5,000,000 10,000,000 10,000,000
A	AUTOMOBILE LIABILITY X ANY AUTO ALL OWNED AUTOS SCHEDULED AUTOS X HIRED AUTOS X NON-OWNED AUTOS			BAP369726113	1/1/2018	1/1/2019	COMBINED SINGLE LIMIT (Ea accident) BODILY INJURY (Per person) BODILY INJURY (Per accident) PROPERTY DAMAGE (Per accident)	$ $ $ $	5,000,000
B	X UMBRELLA LIAB X OCCUR			AUC928038416	1/1/2018	1/1/2019	EACH OCCURRENCE	$	50,000,000
D	EXCESS LIAB CLAIMS-MADE DED RETENTION $			US00068961LI18A	1/1/2018	1/1/2019	AGGREGATE	$	50,000,000
A	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? Y/N: N (Mandatory in NH) If yes, describe under DESCRIPTION OF OPERATIONS below	N/A		WC369726514	1/1/2018	1/1/2019	X PER STATUTE OTH-ER E.L. EACH ACCIDENT E.L. DISEASE - EA EMPLOYEE E.L. DISEASE - POLICY LIMIT	$ $ $	1,000,000 1,000,000 1,000,000
C	Professional and Pollution Liability			EOC937461714	1/1/2018	1/1/2019	Each Occurrence Aggregate		$50,000,000 $50,000,000

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (ACORD 101, Additional Remarks Schedule, may be attached if more space is required)

RE: CONTRACT NO. TBD - NATIONAL WESTERN CENTER HORIZONTAL INTEGRATED CONSTRUCTION SERVICES

As required by written contract, the City and County of Denver, its Elected and Appointed Officials, Employees and Volunteers are included as Additional Insureds as respects the Commercial General Liability and Business Auto.

CERTIFICATE HOLDER

CITY AND COUNTY OF DENVER
201 West Colfax Avenue
Denver, CO 80202

CANCELLATION

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.

AUTHORIZED REPRESENTATIVE

N Keiser, CISR/NKEISE Nancy Keiser

EXHIBIT H
City and County of Denver (CCD)/ National Western Center
Horizontal Integrated Construction Services
Insurance Requirements including participation in the
CCD Rolling Owner Controlled Insurance Program(ROCIP)

1. General Information

The City and County of Denver has arranged for certain activities under the Horizontal Integrated Construction Services contract to be insured under a Rolling Owner Controlled Insurance Program (ROCIP). A ROCIP is a single insurance program that insures the City and County of Denver, the Contractor and Subcontractors of any tier, and other designated parties (Enrolled Parties), for work performed at the project site. Certain trade contractors and subcontractors are ineligible for this program. See Excluded Parties under the definitions section 3.8.F for a complete list of excluded parties. Insurance requirements will be determined based on the scope of work for each Task Order or Work Order. Below is an example of insurance that may be required based on type of work order:

	ROCIP[1]	Auto Liability	Off-site WC	Off-Site General Liability	On-Site WC	On-Site General Liability	Professional Liability	Contractor Pollution Liability
Type 1 Task Order (pre-construction and site wide professional services)		√	√	√	√	√	√	
Type 2 Work Order (temporary site)	√[2]	√	√[2]	√[2]	√[2]	√[2]		√[2]
Type 3 Work Order (construction)	√	√	√	√				

[1] *ROCIP coverage to include on-site WC, on-site General Liability, Builders' Risk, and Contractors Pollution Liability*
[2] *Coverage to be based on scope of work. ROCIP not applicable to contractors providing work as described under Excluded Parties*

2. Insurance Requirements for Non-ROCIP Contractors and Subcontractors (Excluded Parties)

Contractor and each Subcontractor and its lower-tier subcontractors shall require all Excluded Parties, as defined in section 3.8.F, to provide and maintain insurance of the type and in limits as set forth in the Contractor Subcontract Agreement. Such insurance shall include at minimum:

Workers' Compensation/Employer's Liability Insurance: Contractor shall maintain the coverage as required by statute for each work location and shall maintain Employer's Liability insurance with limits of $100,000 per occurrence for each bodily injury claim, $100,000 per occurrence for each bodily injury caused by disease claim, and $500,000 aggregate for all bodily injuries caused by disease claims

Commercial General Liability: Contractor shall maintain a Commercial General Liability insurance policy with limits of $1,000,000 for each occurrence, $1,000,000 for each personal and advertising injury claim, $2,000,000 products and completed operations

aggregate, and $2,000,000 policy aggregate, with the City and County of Denver included as Additional Insured.

Business Automobile Liability: Contractor shall maintain Business Automobile Liability with limits of $1,000,000 combined single limit applicable to all owned, hired and non-owned vehicles used in performing services under this Agreement.

Professional Liability (Errors & Omissions): All Contractors and Subcontractors performing design, engineering, or pre-construction work shall maintain minimum limits of $1,000,000 per claim and $1,000,000 policy aggregate limit. Policy shall include a provision that coverage is primary and non-contributory with any other coverage or self-insurance maintained by the City.

Contractors Pollution Liability: All Contractors and Subcontractors performing demolition, trenching, or excavation work shall maintain minimum limits of $1,000,000 per occurrence and $2,000,000 policy aggregate. Policy to include bodily injury; property damage including loss of use of damaged property; defense costs including costs and expenses incurred in the investigation, defense or settlement of claims; and clean up costs. Policy shall a provision that coverage is primary and non-contributory with any other coverage or self-insurance maintained by the City.

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3. Insurance Requirements for ROCIP Enrolled Contractors and Subcontractors

3.1 Insurance Provided by the CCD ROCIP. The City retains the right to have this Project insured under an Owner Controlled Insurance Program (CCD ROCIP). Coverage under such CCD ROCP shall be provided for Workers' Compensation & Employer's Liability, General Liability, Excess Liability, Contractors Pollution Liability and Builders Risk as outlined herein and as defined by the respective policies for each coverage, for the period from the start of Work through completion and final acceptance by the City except as otherwise provided herein. Should City be unable to procure coverages described in this Section, City will meet with Contractor to review coverage gaps, identify options and determine costs and payment.

3.2 Enrollment Required. Parties performing labor or services at the Project Site are eligible to enroll in the CCD ROCIP, unless they are Excluded Parties (as defined herein). Participation in the CCD ROCIP is mandatory but not automatic. Parties eligible for enrollment shall follow the procedures and use the forms provided in the CCD ROCIP Insurance Manual to enroll in the CCD ROCIP Insurance Program. When the Contractor and Subcontractors and lower-tier subcontractors are properly enrolled in the CCD ROCIP, the CCD ROCIP Administrator will issue or have issued to the Contractor, Subcontractor and lower-tier subcontractors, prior to their commencing Work on the Project Site, a Certificate of Insurance evidencing the coverages arranged by City.

3.3 Exclusion of Contractor/Subcontractor Insurance Costs from Proposal and Bid Prices. Contractor shall exclude from Contractor's cost of work, and ensure that each Subcontractor of every tier exclude from their cost of work, normal costs for insurance without an ROCIP for those coverages provided under the CCD ROCIP. The calculation of these costs will be determined using the forms found in the CCD ROCIP Insurance

Manual. The costs of CCD ROCIP Insurance Coverage includes reductions in insurance premiums, all relevant taxes and assessments, markup on insurance premiums, and losses retained through large deductibles, self-insured retentions, or self-funded other programs. Change orders shall also exclude the cost of ROCIP Coverage. Pre-employment substance abuse testing costs will be covered by the City and should be removed from bid prices. Drug testing will be more thoroughly discussed in the ROCIP Safety Manual.

3.4 Insurance Premiums. City will pay the insurance premiums for the CCD ROCIP Insurance Coverages. The City is responsible for all adjustments to the premiums and will be the sole beneficiary of all dividends, retroactive adjustments, return premiums, and any other monies due through audits or otherwise. The Contractor assigns to the City the right to receive all such adjustments, and will require that each subcontractor of every tier assign to City all such adjustments. The Contractor and the Subcontractors who are Enrolled Parties shall execute such further documentation as may be required by City to accomplish this assignment.

3.5 Off Site Operations. The CCD ROCIP will provide certain insurance coverage for the City, Contractor and Enrolled Parties, along with their Eligible Employees performing Work at the Project Site. Off-site operations shall be covered only if designated in writing by the City and when all operations at such site are identified and solely dedicated to the Project. Contractors and Subcontractors are responsible to notify the CCD ROCIP Administrator in writing, to request coverage for specified off-site operations. Coverage is not provided at the site unless confirmed in writing by the CCD ROCIP Administrator.

3.6 CCD ROCIP Insurance Manual. As soon as practicable, a CCD ROCIP Insurance Manual will be sent to the Enrolled Party and will become a part of the Contract and Contractor's Subcontract with Subcontractor. The CCD ROCIP Insurance Manual will contain the administrative and claim reporting procedures. Contractor agrees to and will require that its Subcontractors and their lower-tier subcontractors also cooperate with the CCD ROCIP Administrator in providing all information as required in the CCD ROCIP Insurance Manual.

3.7 Conflicts. The descriptions of the CCD ROCIP Insurance Coverages set forth in this Section are not intended to be complete or meant to alter or amend any provision of the actual CCD ROCIP Insurance Policies. The CCD ROCIP Insurance Coverages and Exclusions are set forth in full in their respective policy forms. In the event of a conflict or omission between the coverages described in the CCD ROCIP Policies and the coverages summarized or described in the CCD ROCIP Insurance Manual, this Section or elsewhere in the Contract Documents, the Coverages and coverage amounts set forth in the actual CCD ROCIP Insurance Policies issued by the CCD ROCIP Insurers shall control. In the event of a conflict between the provisions of this Section, and the CCD ROCIP Insurance Manual that does not involve any conflict with the provisions of the actual CCD ROCIP Policies issued by the CCD ROCIP Insurers, then the provisions of this Section shall govern. A copy of the actual CCD ROCIP Policies will be provided to the Contractor for review when they become available. Contractor, upon review of the CCD ROCIP Policies, shall have the right to request reasonable revisions to the terms and conditions of the Policies which will be forwarded to the Insurers for review and action.

3.8 Summary of Insurance Coverage

3.8.A Insurance Provided by the City. Unless otherwise provided herein, prior to commencement of the Work, City, at its sole option and expense, shall secure and maintain at all times during the performance of this Contract the insurance specified below, insuring the City, Contractor, its Subcontractors and such other persons or interests as City may designate with limits not less than those specified below for each coverage.

Workers' Compensation & Employer's Liability:

Coverage: Statutory limits required by the Workers' Compensation Laws of the State of Colorado:

Part One:	Workers' Compensation:	Statutory Limits
Part Two:	Employer's Liability:	
	Bodily Injury by Accident:	$2,000,000 each accident
	Bodily Injury by Disease:	$2,000,000 each employee
	Bodily Injury by Disease:	$2,000,000 policy limit

General Liability (excluding Automobile Liability and Professional Liability)**:**

Coverage: Third party personal injury, bodily injury and property damage liability

Limits of Liability:

Annual General Aggregate (Per Project and Reinstates Annually)	$4,000,000
Products/Completed Operations Aggregate (Statute of Repose)	$4,000,000
Personal / Advertising Injury Limit	$2,000,000
Each Occurrence Limit	$2,000,000
Fire Damage Legal Liability (any one fire)	$300,000
Medical Payments (any one person)	$10,000

Excess/Umbrella Liability Insurance (limits noted are minimum limits. The City may elect to provide higher limits, based on the size of the Project):

Coverage: Written on a following form basis over the primary policies.

Minimum Limits of Liability:

Each Occurrence	$200,000,000
General Aggregate (Reinstates Annually)	$200,000,000
Products/Completed Ops Aggregate	$200,000,000

Products/Completed Operations coverage will extend to the statute of repose.

General Liability Insurance Claim Chargeback. A claims charge-back will be assessed for the amount of any loss payable under the CCD ROCIP Commercial General Liability Policy. The Enrolled Party primarily responsible for causing any bodily injury or property damage liability loss shall be responsible for payment of the charge-back. The charge-back will be calculated on the following sliding scale:

For each Contract per Occurrence:
$1,000 for Enrolled Party with contracts up to $100,000
$5,000 for Enrolled Party with contracts between $100,001 and $250,000
$10,000 for Enrolled Party with contracts between $250,001 and $500,000
$25,000 for Enrolled Party with contracts over $500,000

Contractors Pollution Liability Insurance:

The City shall purchase Contractors Pollution Liability arising from claims for pollution incident arising from Work or services performed under contract at or from the designed project site.

Coverage: Liability or responsibility for unexpected and unintended pollution conditions resulting in bodily injury, property damage or environmental damage from pollution conditions caused by covered operations including completed operations. Coverage includes microbial matter and legionella pneumophila in any structure on land and the atmosphere contained with the structure.

Limits of Liability:

Each Loss:	$10,000,000 or more
Policy Aggregate:	$10,000,000 or more

Products/Completed Operations coverage will extend for the statute of repose after final completion of the Project.

Contractors Pollution Insurance Claims Chargeback. A claims charge-back will be assessed for the amount of any loss payable under the Contractors Pollution. Up to the first $5,000 of any loss will be paid by Contractor. This includes all expenses or claim payments incurred by the OCIP Insurer for losses attributable to the Contractor's work, acts or omissions, or the work, acts or omissions of any tier of subcontractor. Contractor may elect to pass this charge through to any responsible subcontractor but in no event may require total subcontractor reimbursement in excess of $5,000.

Builder's Risk Insurance:

The City shall purchase and maintain, Builder's Risk (and/or Installation Floater) in the amount of the initial Contract Sum, plus value of subsequent Contract modifications and cost of materials supplied or installed by others, comprising total value for the entire Project at the site on a replacement cost basis (as defined in the Builders' Risk Policy). Such builders risk insurance shall end when the first of the following occurs: 1) the City's interest in the Work ceases; 2) the policy expires or is cancelled; or 3) the Work is accepted by the City.

Builders' Risk Insurance shall be on an "all-risk" or equivalent policy form and shall include, without limitation, insurance against the perils of fire (with extended coverage) and physical loss of damage including , theft, vandalism, malicious mischief, terrorism, rigging and hoisting for materials and equipment that are part of the Project, collapse, earthquake, flood, windstorm, falsework, testing and startup (as provided by the policy), temporary buildings and debris removal including demolition occasioned by enforcement of any applicable ordinance laws, and shall cover reasonable compensation for services and expenses required as a result of such insured loss.

This Builder's Risk Insurance shall cover portion of the Work stored off site, and also portions of the Work in transit.

The City and Contractor shall waive all rights against (1) each other and any of their subcontractors, sub-subcontractors, agents and employees, each of the other, and (2) the Architect, Architect's consultants, separate contractors, if any, and any of their subcontractors, sub-subcontractors, agents and employees, for damages caused by fire or other causes of loss to the extent covered by builders risk insurance obtained pursuant to this section or other property insurance applicable to the Work, except such rights as they have to proceeds of such insurance held by the City as fiduciary. The City or Contractor, as appropriate, shall require of the Architect, Architect's consultants, separate contractors, and they subcontractors, sub-subcontractors, agents and employees of any of them, by appropriate agreements, written where legally required for validity, similar waivers each in favor of other parties enumerated herein. The policies shall provide such waivers of subrogation by endorsement or otherwise. A waiver of subrogation shall be effective as to a person or entity even though that person or entity would otherwise have a duty of indemnification, contractual or otherwise, did not pay the insurance premium directly or indirectly, and whether or not the person or entity had an insurable interest in the property damaged.

A copy of the actual CCD ROCIP Builder's Risk Policy will be provided to the Contractor for review when they become available. Contractor, upon review of the CCD ROCIP Policies, shall have the right to request reasonable revisions.which shall be forwarded to the Insurers for review and action.

Builder's Risk Insurance Claims Chargeback. A claims charge-back will be assessed for the amount of any loss payable under the Builder's Risk Policy. Up to the first $5,000 of any loss will be paid by Contractor. This includes all expenses or claim payments incurred by the CCD ROCIP Insurer for losses attributable to the Contractor's work, acts or omissions, or the work, acts or omissions of any tier of subcontractor. Contractor may elect to pass this charge through to any responsible subcontractor but in no event may require total subcontractor reimbursement in excess of $5,000.

3.8.B Insurance provided by Enrolled Parties. At their own expense, the Enrolled Parties of all tiers must carry the following minimum coverage and limits:

Commercial Automobile Liability Insurance for contract work both occurring on-site and off-site with limits of liability not less than:

$1,000,000 Combined Single Limit

This insurance must apply to all owned, leased, non-owned or hired vehicles to be used in the performance of work. Such insurance shall allow contractor to waive subrogation against the City and/or its representatives and all Contractors and Subcontractors prior to loss or shall include a waiver of the insurer's right of subrogation. Contractor hereby waives rights of subrogation against City and/or its representatives and all Contractors and Subcontractors. If transporting wastes, hazardous material, or regulated substances, Contractor shall carry a pollution coverage endorsement and an MCS 90 endorsement on their policy. Transportation coverage under the Contractors Pollution Liability policy shall be an acceptable replacement for a pollution endorsement to the Business Automobile Liability policy.

Off-Site Workers' Compensation Insurance, including Employer's Liability with minimum limits of:

$1,000,000 Bodily Injury with Accident – Each Accident
$1,000,000 Bodily Injury with Disease – Policy Limit
$1,000,000 Bodily Injury with Disease – Each Employee

Coverage to protect Contractor/Subcontractor from and against all claims arising from performance of Work outside the Project Site under the Contract. Such insurance (where permissible by law) shall waive subrogation against the City and/or its representatives and all Contractors and Subcontractors.

Off-Site Commercial General Liability Insurance for Contract operations not physically occurring within the Project Site with a limit of liability not less than:

Primary Insurance

$1,000,000 Each Occurrence
$1,000,000 Personal Injury and Advertising Injury
$2,000,000 General Aggregate
$2,000,000 Products/Completed Operations Aggregate

Such policy shall include coverage for contractual liability assumed under the Contract, contractors' protective liability, and explosion, collapse and underground property damage hazards. The Policy Form should be CG 00 01 or equivalent. Contractor and Subcontractors of all tiers will be required to provide additional Insured status to the City for general liability policies in the name of:

THE CITY AND COUNTY OF DENVER, ITS ELECTED AND APPOINTED OFFICIALS, EMPLOYEES AND VOLUNTEERS

The additional Insured status shall provide coverage for the Premises/Operations and Products/Completed Operations exposures and shall indicate that such coverage is primary to any insurance carried by the City.

Professional Liability Insurance (if required based on scope of work)

Contractor shall maintain a Professional Liability policy that shall be primary and non-contributory with any other coverage or self-insurance maintained by the City.

Limits of Liability:

Each Loss:	As required by contract
Policy Aggregate:	As required by contract

3.8.C Contractor Warranties and Agreements

Accuracy of Contractor-provided Information. Contractor warrants that all information submitted to the City or the CCD ROCIP Administrator is accurate and complete to the best of its knowledge. Contractor will notify the City or CCD ROCIP Administrator immediately in writing of any errors discovered during the performance of the work.

Contractor Responsible To Review Coverage. Contractor acknowledges that all references to CCD ROCIP Insurance policy terms, conditions, and limits of liability in this document, as well as the CCD ROCIP Insurance Manual, are for reference only. Contractor and its subcontractors are responsible for conducting their own independent review and analysis of the CCD ROCIP Insurance Coverages in formulating any opinion or belief as to the applicability to such coverage in the event of any loss or potential claim. Any type of insurance or increase of limits not described above which the Contractor requires for its own protection or on account of statute shall be its own responsibility and at its own expense.

Audit. Contractor agrees to make its records available for review and to cooperate with the insurers, the brokers, the City, the Auditor of the City, and the representatives of the aforesaid parties in the event of an audit. Such audits shall occur periodically during the performance hereunder. In the event that a City audit of Contractor's records, as permitted in the Contract or other CCD ROCIP documents, reveals a discrepancy in the insurance, payroll, safety, or any other information required to be provided to City or CCD ROCIP Administrator, or reveals inclusion of costs for the CCD ROCIP Insurance Coverage in any payment for the work, City will have the right to deduct from payments due Contractor all such insurance costs as well as all audit costs.

Insurance Costs Removed. Contractor warrants that the Costs for insurance as provided under the CCD ROCIP were not included in Contractor's bid or proposal for the Work, the Contract Price/Contract Sum, and will not be included in any change order or any request for payment for the Work or extra work.

3.8.D Contractor Obligations

CCD ROCIP Documents shall be provided to Subcontractors. Contractor shall furnish each bidding Subcontractor, vendor, supplier, material dealer or other party a copy of this CCD ROCIP Exhibit and the CCD ROCIP Insurance Manual and shall incorporate the terms of this Exhibit in all contracts and agreements entered into for performance of any portion of the Work.

Timely Enrollment Required. Contractor shall enroll in the CCD ROCIP Insurance Program within five (5) days request by City or its CCD ROCIP Administrator. Contractor shall notify each Subcontractor of the procedure for enrolling in CCD ROCIP and confirm that enrollment is mandatory but not automatic. Contractor shall assure that Subcontractor and its lower-tier subcontractors shall not commence work until verification of enrollment is confirmed by the CCD ROCIP Administrator by the issuance of a Certificate of Insurance.

Compliance with Conditions. Contractor shall not violate any condition of the policies of insurance provided by City under the terms of this CCD ROCIP Exhibit or the CCD ROCIP Insurance Manual. All requirements imposed by the subject policies and to be performed by Contractor shall likewise be imposed on, assumed, and performed by each Subcontractor and their lower-tier subcontractors.

Claims Cooperation. Contractor shall participate in the claim reporting procedures of City's CCD ROCIP Insurance Program. Contractor agrees to assist and cooperate in every manner possible in connection with the adjustment of all claims arising out of operations within the scope of the Work required by the Contract, and to cooperate with the Insurer in all claims and demands which City's Insurer(s) is called upon to adjust or to defend against. Contractor shall take all necessary action to assure that its Subcontractors and their lower-tier subcontractors comply with any such request for assistance and cooperation. This obligation includes, without limitation, providing light or modified duty for injured workers, appearing in mediation, arbitration or court proceedings and/or participating in settlement meetings, as may be required.

Monthly Payroll Submission. All Enrolled Parties shall submit monthly payrolls and worker-hour reports to City or CCD ROCIP Administrator on via the CCD ROCIP Administrators on-line Payroll Reporting System as outlined in the CCD ROCIP Insurance Manual. The on-line reporting instructions will be provided to all Contractors at time of enrollment into the CCD ROCIP Insurance Program. Failure to submit these reports may result in funds being held or delayed from monthly progress payments. Payroll must be submitted on-line for each month, including zero (0) payroll, if applicable, until completion of the Work under each Contract and Subcontract. For those Subcontractors and lower-tier subcontractors performing Work under multiple Subcontracts, a separate payroll report is required for each Subcontract under which Work is being performed.

Response to Information Requests. All insurance underwriting, payroll, rating or loss history information requested by City or the CCD ROCIP Administrator shall be provided by the Contractor within three (3) business days of the request. Contractor agrees (and will require each Subcontractor to agree) that City, City's insurer or City's representative may audit the Contractor's or Subcontractor's records and the records of lower-tier subcontractors to confirm the accuracy of all insurance information provided, including, without limitation, any such information that may have any effect on insurance resulting from changes in the Work. At all times during performance of the Contract and Subcontracts, the Contractor, Subcontractor and lower-tier subcontractors shall cooperate with City, CCD ROCIP Administrator and CCD ROCIP insurers.

Responsibility for Safety. Notwithstanding the CCD ROCIP, the Contractor shall initiate, maintain and supervise all safety precautions and programs in connection with the Work.

Contractor is solely responsible, at no adjustment to the contract sum payable or contract time, for initiating, maintaining, and supervising all safety precautions and programs relating to the conduct of Work, including, without limitation, any safety programs or procedures that are required by any applicable state or federal laws, rules or regulations, or by the terms of the CCD ROCIP Safety Manual.

Duty of Care. Nothing herein shall relieve the Enrolled Parties of their respective obligations to exercise due care in the performance of their duties in connection with the Work or to complete the Work in compliance with this Contract and subsequent subcontracts.

3.8.E. Notices, Costs

Limitations on City Provided Coverage. City assumes no obligations to provide insurance other than that evidenced by the policies referred to in Paragraph 3.1 and subparagraphs. City, however, reserves the right to furnish insurance coverage of various types and limits provided that such coverage shall not be less than that specified in Paragraph 3.1 and the costs of such insurance shall be paid by City. The CCD ROCIP Insurance Program also does not cover Workers' Compensation claims or Commercial General Liability claims arising from "Off-Site Work."

Contractors Responsible for Own Equipment. Contractors' Equipment insurance for all construction tools and equipment whether owned, leased, rented, borrowed or used on work at the Project Site is the responsibility of the Contractor and/or Subcontractor, and the City shall not be responsible for any loss or damage to tools and equipment. This Contractors' Equipment insurance shall contain a waiver of subrogation against City and/or its representatives and all approved Contractors and Subcontractors. If an individual Enrolled Party does not purchase such insurance, that Enrolled Party will hold harmless City and/or its representatives and other Enrolled Parties for damage to tools and equipment.

No Release; No Waiver of Immunity. The provision of the CCD ROCIP shall in no way be interpreted as relieving CM or any Subcontractor of any responsibility or liability under the Contract Documents, the CCD ROCIP Insurance Policies, or Applicable Laws, including, without limitation, Contractor's and Subcontractor's responsibilities relative to indemnification and their obligation to exercise due care in the performance of the Work and to complete the Work in strict compliance with the Contract Documents. The parties hereto understand and agree that the City, its officers, officials and employees, are relying on, and do not waive or intend to waive by any provisions of this agreement, the monetary limitations or any other rights, immunities and protections provided by the Colorado Governmental Immunity Act, §§ 24-10-101 to 120, C.R.S., or otherwise available to the City, its officers, officials and employees.

City Right to Withhold Payments. In addition to any other rights of withholding that City may have under the Contract Documents, City has the right to withhold any payments otherwise due to Contractor in the event of a failure by Contractor or any Subcontractor to comply with the requirements of this Exhibit or the CCD ROCIP Insurance Manual. City may withhold from any payment owing to Contractor the Costs of CCD ROCIP Insurance Coverages if included in a request for payment. Such withholding by City shall not be

deemed to be a default under the Construction Contract. City shall withhold from Contractor the Costs of CCD ROCIP Insurance Coverages attributable to an increase in an Enrolled Party's total payroll for the Work over the amount reported to City and CCD ROCIP Administrator at time of enrollment in the CCD ROCIP Insurance Program.

City Remedies. Without limitation upon any of City's other rights or remedies, any failure of an Enrolled Party to comply with any provision of this Exhibit or the CCD ROCIP Insurance Manual shall be deemed a material breach of the Construction Contract, thereby entitling City, at its option, upon notice to Contractor, to suspend performance by Contractor, without any adjustment to Contract Sum Payable or Contract Time, until there is full compliance, or (2) or terminate this Construction Contract for cause.

Off-Site Storage. Unless otherwise provided in the Contract Documents, the property insurance provided by the City shall not cover portions of the Work stored off the Site without written approval of the City. Contractor shall be responsible for reporting such property or work if ownership has been transferred to the City. If ownership rests with the Contractor, Contractor shall be responsible for obtaining insurance to protect its interests.

Partial Occupancy. Partial occupancy or use shall not commence until the insurance company or companies providing Builders Risk and/or Property Insurance have consented to such partial occupancy or use by endorsement or otherwise. The City and the Contractor shall take reasonable steps to obtain consent of the insurance company or companies and shall, without mutual written consent, take no action with respect to partial occupancy or use that would cause cancellation, lapse or reduction of insurance.

City Right to Exclude Parties from the CCD ROCIP Insurance Program. City reserves the right to exclude any Subcontractor from the CCD ROCIP Insurance Program, before or after enrollment by the Subcontractor into the CCD ROCIP Insurance Program. If City elects to exclude a Subcontractor from the CCD ROCIP Insurance Program, the Contractor will be responsible for ensuring the insurance coverages outlined in the Contractor's Subcontract Agreement are provided to the City or CCD ROCIP Administrator before the Subcontractor can begin or resume work on the Project.

City's Right to Modify or Discontinue the CCD ROCIP Insurance Coverages. If the City determines that modification or discontinuation of the ROCIP is in the best interest of all parties, the Contractor and Subcontractor will receive sixty (60) days notice to secure and maintain such insurance as is required to provide replacement coverage comparable to that provided under the ROCIP. Provided that the foregoing is not the result of any failure by the Contractor or any Subcontractor to comply with the requirements of the Contract Documents or CCD ROCIP Reference Guide, the costs of such replacement insurance shall be deemed a Cost of Work for which the Contractor shall be entitled to a Contract Adjustment, without any sum added thereto for Allowable Markup. The form, content, limits of liability, cost and the rating of the insurer issuing such replacement insurance shall be subject to the City's prior written approval.

City Right to Purchase Other Coverages. The City reserves the right at its option, and without obligation to do so, to furnish other insurance coverage of various types and limits if such coverage is not less than that specified in the Contract Documents to be provided by the City. Apart from the CCD ROCIP Insurance Coverages, the City may at its option

purchase additional insurance coverages that insure the Project that may not necessarily insure the Contractor or the Subcontractors. Without limitation, examples of such coverage may include pollution liability, excess professional liability, and excess automobile liability insurance.

3.8.F. Definitions

Certificate of Insurance:	Evidence of the insurance coverage afforded under the CCD ROCIP. Also, evidence of insurance coverage provided by Enrolled Parties for automobile liability, offsite exposures, and any additional insurance requirements that may be required by CCD.
City:	City and County of Denver (CCD)
Contract:	The written agreement between the City and County of Denver and Lead Contractor describing the Work, Contract Terms and Conditions, or a portion thereof. Also includes a written agreement between a Contractor and any tier of subcontractor.
Lead Contractor:	The Contractor that the City and County of Denver enters directly into a formal Contract for work performed at the Project Site.
Contractor insurance cost	The Costs of ROCIP Coverage is defined as the amount of Contractor's and eligible Subcontractors' of every tier reduction in insurance costs due to the ROCIP Program.
Rolling Owner Controlled Insurance Program (ROCIP):	A coordinated insurance program providing certain coverage, as defined herein, for the City, Contractor and Enrolled Subcontractors, along with their Eligible Employees, performing Work at the Project Site.
Eligible Employees:	Employees of Enrolled Subcontractors who are not excluded from the ROCIP under the "Excluded Parties" definition.
Enrolled Parties:	The Contractor and those Subcontractors that have submitted all necessary enrollment information and been accepted into the ROCIP as evidenced by the issuance of a Certificate of Insurance.
Excluded Parties:	Parties not covered by the ROCIP because of ineligibility. No insurance coverage provided by City under the ROCIP shall extend to the activities or products of the following:

(1) Any person or organization that fabricates or manufactures products, materials or supplies away from the Project Site(s);

(2) Hazardous materials remediation, removal, or transportation companies and their consultants;

(3) Any architect, engineer or surveyor and their consultants except when approved by City;

(4) Truckers, haulers, material dealers, vendors, suppliers, and others who merely transport, pick up, deliver or carry materials, personnel, parts or equipment or any other items or persons to or from the Site;

(5) Contractors and their subcontractors and subconsultants and any employee of an Enrolled Party, who does not work at the Project Site;

(6) Any employees of an Enrolled Party who occasionally visits the Project Site to make deliveries, pick-up supplies or personnel, to perform supervisory or progress inspections, or for any other reason;

(7) Persons or entities who are not enrolled parties or included as insureds within the policies;

(8) Any Day Labor Employees (labor service employees whose coverage is provided by their employer); or

(9) Any other person or entity specifically excluded by City, in its sole discretion, from participation as Enrolled Parties.

Insured: (liability policies) — The City, Contractor and Enrolled Parties and their Eligible Employees and any other party named in the insurance policies.

Insurers — Those Insurance Companies providing the ROCIP insurance coverage. The Insurers will be identified in the ROCIP Manual.

Net Bid: — Contractor bids with insurance costs removed because of the obligation of any Enrolled Party to delete insurance costs for coverage provided by the ROCIP from its bid and all change orders. Net bids are subject to verification by the Administrator through the providing of contractors' rate and declaration pages from their Insurance policies.

ROCIP Administrator:	Arthur J. Gallagher, the insurance services firm selected by the City to administer the ROCIP and provide insurance brokerage services as required.
ROCIP Manual	A reference document provided to contractors of all tiers, which summarizes the terms and provisions of the ROCIP and provides information about compliance with ROCIP requirements.
ROCIP Safety Manual	A reference document provided to contractors of all tiers which contains workplace safety requirements of all enrolled parties.
Off-Site Work	Work performed away from the Project Site.
Payroll:	For purposes of the ROCIP only, refers to Unburdened Straight Time Payroll per Workers Compensation Class Code.
Policy Owner:	The City and County of Denver
Project:	The Project as defined in the contract documents and as described in the Declarations of the CCD ROCIP policies.
Project Site:	Means those areas designated in writing by the City and County of Denver in a Contract document for performance of the Work and such additional areas as may be designated in writing by the City and County of Denver for Contractors' use in performance of the Work. Subject to the ROCIP Insurers written approval, the term "Project Site" shall also include: (1) field office sites, (2) property used for bonded storage of material for the Project approved by the City and County of Denver, staging areas dedicated to the Project, and (4) areas where activities incidental to the Project are being performed by Contractor or Subcontractors covered by the CCD ROCIP Worker's Compensation policy (if included) , but excluding any permanent locations of Contractor or such covered Subcontractors. <u>Items 1 through 4 above must be approved by the ROCIP Insurer and listed on the CCD ROCIP Policy (ies).</u>
Subcontract:	The written agreement between Contractor and Subcontractor, or between Subcontractor and a lower tier Subcontractor, describing the Work, Subcontract Terms and Conditions, or a portion thereof.

Subcontractor: Includes those persons, firms, joint venture entities, corporations, or other parties that enter into a Subcontract with Contractor to perform Work at the Project Sites and any of these Subcontractor's lower-tier subcontractors.

Work: Operations, as fully described in the Contract and Subcontract, performed at the Project Site.

Arthur J. Gallagher & Co.

CCD ROCIP Insurance Manual

Project No.: **[Enter Project Number]**

The above Project No. is important when enrolling you must have this code to enroll

Project: **[Enter Project Name]**

Prime Contractor: **[Manager]**

DENVER
THE MILE HIGH CITY

CITY AND COUNTY OF DENVER
201 W. Colfax Dept. 1010
Denver, CO 80202

Table of Contents Page

Section 1

Overview

Welcome to the CITY AND COUNTY OF DENVER ROCIP PROGRAM (CCD ROCIP)

A ROCIP is a program that insures the Project Owner, all Enrolled Contractors, Enrolled Subcontractors of every tier and other designated parties for Work performed for various Projects at the City and County of Denver's National Western Center site. Certain contractors and subcontractors are ineligible for this program. These parties are identified in the definitions section of this manual and in Section 4.

Coverage under the ROCIP Program includes Workers' Compensation, Employers Liability, General Liability, Excess Liability, Builders Risk and Contractors Pollution Liability.

Since the City and County of Denver will pay insurance premiums for the ROCIP coverages described in this manual, you should notify your insurer(s) to delete from your insurance program charges for the on sites activities of this Project that are covered under the ROCIP. **Each bidder of every tier is required to exclude from its' bid price, its normal cost for the insurance coverages to be provided by the City and County of Denver under the ROCIP Program. All subsequent change orders will also exclude these costs. Excluded insurance costs are subject to verification and documentation by the ROCIP Administrator.**

Note: PARTICIPATION IS MANDATORY-NOT OPTIONAL

Insurance coverage and limits provided under the ROCIP are specific to the CCD ROCIP Projects. Your insurance representative should review this information and assist with you in determining your insurance costs based on your insurance requirements. Any additional coverage you may wish to purchase will be at your option and expense. If you elect to do so, we have the right to review it.

About This Manual

This manual was prepared by Arthur J. Gallagher Risk Management Services, Inc., which is the insurance broker and ROCIP administrator. The manual is designed to identify, define and assign responsibilities for the administration of the ROCIP for the CCD ROCIP

What This Manual Does

This Manual:

- Generally describes the CCD ROCIP
- Identifies responsibilities of the various parties involved in the Projects
- Provides a basic description of the CCD ROCIP operation
- Describes some audit and administrative procedures
- Provides answers to basic questions about the CCD ROCIP
- Will be updated throughout the course of the Projects as necessary

What this Manual Does Not Do

This Manual does not:

- Provide coverage interpretations
- Provide complete information about CCD ROCIP coverages
- Provide answers to specific claims questions

Specific questions about the CCD ROCIP, its administration or the coverage's provided, should be directed in writing to the appropriate party identified in the Project Directory section immediately following this introduction.

Disclaimer

The information in this manual is intended to outline the ROCIP Program. If any conflict exists between this manual and the ROCIP insurance policies or Contracts between the Owner and Contractor, the policies or Contracts will govern.

Key Information

This manual includes several important sections that provide quick reference information for contractors and subcontractors. Among these are:

- Project Directory: A listing of key contact people who can provide further information
- Definitions: A list of words used in the manual and their meanings under the ROCIP
- Enrollment Instructions and Other Claim Reporting Forms: Instructions for enrolling into the CCD ROCIP via Gallagher's on-line system, and claims reporting workers' compensation claims via TBD website are provided.

Section 2

CCD ROCIP Project Directory

The following list includes key risk management and insurance personnel involved in the Projects.

CCD ROCIP ADMINISTRATION - GALLAGHER

ROCIP Service Team – Arthur J. Gallagher Risk Management Services, Inc.			
CCD ROCIP Administrator.....	Heather Lawson	314.800.2205	heather_lawson@ajg.com
Safety/Loss Control	Ed Davis	303.889.2552	ed_davis@ajg.com
Safety/Loss Control	Terry McIntire	925.407.5451	terry_mcintire@ajg.com
CCD ROCIP Claims	Kendall Trump	303.889.2570	kendall_trump@ajg.com

CCD ROCIP MANAGEMENT - GALLAGHER

Arthur J. Gallagher Risk Management Services, Inc.			
Account Executive	Karen Graham	303.889.2538	karen_graham@ajg.com
Account Executive …….	Scott Whiteside	510.207.0115	scott_whiteside@ajg.com
CCD ROCIP Program Manager.....	Priscilla McCoy	303.889.2540	priscilla_mccoy@ajg.com

CCD ROCIP MANAGEMENT - CITY AND COUNTY OF DENVER

CCD ROCIP Management Team			
Owner Representative / CCD Risk Manager	Devron McMillin	720-913-3345	Devron.McMillin@denvergov.org
Overall Safety Manager			
Assigned Project Manager/ Safety & Health			
Assigned Project Manager/ Safety & Health			

Section 3

Definitions

The following is a summary of definitions applicable to the CCD ROCIP used in this manual.

Approved Additional Sites: Projects as identified in the CITY AND COUNTY OF DENVER, CCD ROCIP contract documents and on file with the insurance company.

Broker: Arthur J. Gallagher Risk Management Services, Inc. herein referred to as "Broker" or "Gallagher".

Certificate of Insurance: A document providing evidence of the existence of coverage for a particular insurance policy or policies.

Change Order: An amendment to the existing, original or most recent scope of work, either increasing or decreasing the breadth of task orders, or their numbers, which may result in greater or reduced charges.

Contract: A written agreement between the CITY AND COUNTY OF DENVER and the Contractor describing the Work, Contract Terms and Conditions, or a portion thereof. Also includes a written agreement between a Contractor and any tier of Subcontractor.

Contractor: The person, firm, joint venture, corporation, other party or entity that has entered into a Contract with THE CITY AND COUNTY OF DENVER AND THE DEPARTMENT OF AVIATION to perform Work at the Project Site(s).

Contractor Safety Supervisor: The Safety Coordinator for each major contractor on site is responsible for the safety of that contractor, its subcontractors and their employees. This representative is also the liaison with Gallagher and DIA assigned Project Managers.

Completed Operations Coverage: Completed Operations Coverage is extended for a period of eight (8) years commencing at the earliest of either: 1) completion and/or acceptance of the work by the CITY AND COUNTY OF DENVER, 2) that portion of the Project is put to its intended use by the CITY AND COUNTY OF DENVER

Employer: Any individual, firm, corporation or other entity, which provides direct construction labor, including supervisory labor, for work performed at the Project Sites.

Enrolled Parties: The Contractor and those Subcontractors that have submitted all necessary enrollment information and been accepted into the ROCIP as evidenced by the issuance of a Certificate of Insurance.

Non-Enrolled: **A "Non-Enrolled" Contractor or Subcontractor is one that has not submitted the required enrollment forms. A "Non-Enrolled" Contractor or Subcontractor is also one that has submitted the required enrollment forms and has either not received written confirmation from the Owner's representative evidencing acceptance into the ROCIP or has received written confirmation from the Owner or its representative declining acceptance into the ROCIP. The ROCIP does not insure "Non-Enrolled" Contractors, Subcontractors or Sub-subcontractors.**

Ineligible Party: Parties not covered by the ROCIP because of ineligibility. No insurance coverage provided by City and County of Denver under the CCD ROCIP shall extend to the activities or products of the following:

(1) Any person or organization that fabricates or manufactures products, materials or supplies away from the Project Site(s) with no direct onsite installation responsibility;

(2) Hazardous materials remediation, removal, or transportation companies and their consultants;

(3) Any architect, engineer or surveyor or their consultants.

(4) Truckers, haulers, material dealers, vendors, suppliers, and others who merely transport, pick up, deliver or carry materials, personnel, parts or equipment or any other items or persons to or from the Site;

(5) Contractors and their subcontractors and subconsultants and any employee of an Enrolled Party, who does not work at the Project Site;

(6) Any employees of an Enrolled Party who occasionally visits the Project Site to make deliveries, pick-up supplies or personnel, to perform supervisory or progress inspections, or for any other reason;

(7) Persons or entities who are not enrolled parties or included as insureds within the policies;

(8) Any Day Labor Employees (labor service employees whose coverage is provided by their employer); or

(9) Fire Watch personnel; or

(10) Any other person or entity specifically excluded by City, in its sole discretion, from participation as Enrolled Parties.

It is your responsibility to contact the CCD ROCIP Administrator and confirm your eligibility before you begin work on the project.

If you are uncertain as to whether your firm will participate in the CCD ROCIP Program, or wish confirmation of your eligibility, please contact the CCD ROCIP Administrator.

Insured: The CITY AND COUNTY OF DENVER and its subsidiary and affiliated companies; Enrolled Contractors and subcontractors of any tier and any other party so named in the insurance policies.

Additional Insured: The CITY AND COUNTY OF DENVER and any other party so named in the insurance policies.

Insurer: The insurance companies which provide coverages for the CCD ROCIP.

ROCIP: Rolling Owner Controlled Insurance Program – A coordinated insurance program providing certain insurance coverages as generally described in this manual for Work at the Project Sites.

ROCIP Administrator: Arthur J. Gallagher Risk Management Services, Inc. herein referred to as the "ROCIP Administrator."

On-Sites Activities: Those activities "at or emanating from" the Project Site.

Payroll Reports: Monthly Payroll Reports are mandatory. For purposes of the CCD ROCIP, payroll refers to **unburdened** straight time payroll per Workers' Compensation Class Codes.

Policy Owner: The CITY AND COUNTY OF DENVER, CCD ROCIP.

Policy Term: The Policy Term will cover the period of construction through project completion, including a (8) year term for Completed Operations.

Project Sites: "Project Sites" shall mean those areas designated in writing by the CITY AND COUNTY OF DENVER, CCD ROCIP in a Contract document for performance of the Work and such additional areas as may be designated in writing by the CITY AND COUNTY OF DENVER for Contractors' use in performance of the Work. Subject to ROCIP Insurers written approval, the term "Project Site" shall also include: (1) field office sites, (2) property used for bonded storage of material for the Project approved by the CITY AND COUNTY OF DENVER, (3) staging areas dedicated to the Project, and (4) areas where activities incidental to the Project are being performed by Contractor or Subcontractors covered by the worker's compensation policy included in the ROCIP, but excluding any permanent locations of Contractor or such covered Subcontractors.

Items 1 through 4 above must be approved by the CCD ROCIP Insurer and listed on the CCD ROCIP Policy.

Subcontractor: Includes those persons, firms, joint venture entities, corporations, or other parties that enter into a Subcontract with Contractor to perform Work at the Project Site and any of these Subcontractor's lower-tier subcontractors.

Work: Operations as fully described in the Contract and Subcontract, performed at or emanating directly from the Project Sites. Also, the entire completed construction or the various separately identifiable parts required to be furnished under the Contract documents.

Section 4

CCD ROCIP Insurance Coverages

This section provides a brief description of CCD ROCIP coverages. The actual policies that control the details concerning coverage, exclusions and limitations are available upon request.

Covered Parties

Parties covered as Named Insured's include the CITY AND COUNTY OF DENVER, CCD ROCIP, its' related entities, and Enrolled Contractors and Subcontractors of any tier. Parties included as Additional Insured's include all those designated by the CITY AND COUNTY OF DENVER, and any other party that a Named Insured is required under contract to add as an additional insured.

Those Not Covered

A) Ineligible for coverage are: lawyers, real estate brokers, vendors, suppliers, material dealers, off-site fabricators with no on-site labor, and those personnel involved merely in fire watch services, loading, transporting and unloading materials, personnel, parts, equipment or any other items to, from or within the Project Sites. Contractors performing jobs that are not eligible for CCD ROCIP coverage, may include but are not limited to those contractors who present an exceptionally hazardous exposure or risk to the jobsites

B) Those who are not enrolled.

C) Those who are not added as Additional Insured's.

Evidence of Coverage

Each Enrolled Contractor and Subcontractor will be issued a Certificate of Insurance evidencing Workers' Compensation, General Liability and Excess Liability insurance to each Enrolled Contractor and Subcontractor of any tier, each of whom will be an Insured on the policies. Other documentation including forms, posting notices, etc., will be available at the Project Sites. Policy copies will be made available upon written request to the CCD ROCIP Administrator.

Description of ROCIP Coverages

The following sections provide a summary of the policies that the CITY AND COUNTY OF DENVER, CCD ROCIP has obtained for this Project. The limits shown will be the minimum limits purchased by the Owner.

Workers Compensation and Employers Liability:

A single policy will be issued to each Enrolled Contractor for workers' compensation coverage.

Part One -	Workers' Compensation:	Statutory Limit
Part Two -	Employer's Liability:	Annual Limits Per Insured
	Bodily Injury by Accident, each Accident	$1,000,000
	Bodily Injury by Disease, each employee	$1,000,000
	Bodily Injury by Disease, policy limit	$1,000,000

- Other States Coverage
- Designated Projects Endorsement
- Waiver of Subrogation
- Alternate Employer Endorsement
- Maritime/Jones Act – If Required
- FELA – If Required

Commercial General Liability:

A single policy will be issued to DEN. Each Enrolled Party for General Liability. Contractor and Subcontractor will be issued a Certificate of Insurance.

(Shared by all insured's)	Limits of Liability
Annual General Aggregate (Per Project)	$4,000,000 (Per Project)
Annual General Aggregate (owned/leased premises)	$4,000,000
Products/Completed Operations Aggregate (Per Project)	$4,000,000 (Per Project)
Total Products/Completed Operations Aggregate	$6,000,000
Applies over 8 years	
Personal / Advertising Injury Limit	$2,000,000
Each Occurrence Limit	$2,000,000
Fire Damage Legal Liability (any one fire)	$300,000
Medical Payments (any one person)	$10,000

- Occurrence Form with Amendatory Endorsements
- Named Insured Endorsement
- Designated Projects Schedule
- Long Term Construction Project Endorsement
- Legal defense outside policy limits
- Annual Reinstatement of Aggregates as defined in the policies
- Eight (8) Year Products & Completed Operations Extension commencing when your work is considered to be completed as defined in the General Liability Policy
- Limited Exclusion - Contractors Professional Liability Endorsement
- Repair Work Coverage – 24 Months
- Absolute Lead Exclusion
- Nuclear Energy Liability Exclusion
- Above is only a summary and actual terms and conditions are contained in the policies

Exception/Notes: The CCD ROCIP coverage is limited solely to Work performed at the Designated Project Site and the products and materials permanently incorporated into the Project. Off-site operations shall be covered only if approved by the ROCIP Insurers, designated in writing by the ROCIP Administrator, and when all operations at such site are identified and solely dedicated to the Project. It shall be the responsibility of the Contractors and Subcontractors to notify the ROCIP Administrator, in writing to request coverage for specified off-site operations.

Claims Charge-Back: A claims charge-back will be assessed for the amount of any loss payable under the ROCIP **Commercial General Liability Policy**. The Enrolled Party primarily responsible for causing any bodily injury or property damage liability loss shall be responsible for payment of the charge-back. The charge-back will equal the deductible under the Enrolled Party's commercial general liability policy (non-ROCIP) up to a maximum charge-back of $25,000. The minimum charge-back shall be the actual loss or $5,000 whichever is less. The charge-back shall be applied on the same basis as applied under the Contractor's or Subcontractor's commercial general liability insurance policy. All Enrolled Parties are required to provide the City and County of Denver, a copy of their Commercial General Liability insurance deductible endorsement for the purpose of determining the charge-back. If the loss exceeds $5,000 and information necessary to determine an Enrolled Party's deductible as stated on its commercial general insurance certificate is not available to the City, the City and County of Denver will charge the Enrolled Party the actual loss up to a $25,000 maximum per occurrence until receipt of documentation from the Enrolled Party's commercial general insurance policy evidencing the contractor's actual deductible. If the loss is less than $5,000, the City and County of Denver will charge the actual loss. The charge-back does not apply to workers' compensation claims for an Enrolled Party's own employee.

Excess Liability:

	Limits of Liability shared by all Insureds
Each Occurrence Limit	$200,000,000
General/Other Aggregate Limit (reinstates annually)	$200,000,000
Products/Completed Operations Aggregate Limit	$200,000,000

- "Pay on behalf" wording with legal defense outside the limits
- Designated Projects Schedule
- Scheduled Underlying Coverage's: Employer's Liability; Primary Commercial General Liability
- Eight (8) Years Products & Completed Operations Extension (single policy term aggregate) commencing when your work is considered to be completed as defined in the General Liability Policy
- Excludes: Automobile Liability, Asbestos; Lead, Silica, Discrimination & Wrongful Termination; War, Nuclear; Pollution (except where noted); and other policy terms and conditions
- Above is only a summary and actual terms and conditions are contained in the policies

Note

Contractors and Subcontractors of any tier are advised to arrange their own insurance for Contractor-owned or –leased equipment and materials not intended for inclusion in the Project. The CCD ROCIP will not cover Contractor-owned or leased property.

Contractors Pollution Liability Insurance
(Shared by all insureds)

Coverage: Liability or responsibility for bodily injury, property damage or environmental damage caused by a pollution event resulting from covered operations and completed operations. Coverage includes microbial matter and legionella pneumophila in any structure on land and the atmosphere contained with the structure.

Limits of Liability:

Each Loss:	$10,000,000
Policy Aggregate	$10,000,000

Products/Completed Operations coverage will extend for eight (8) years after final completion of the Project.

Exception/Notes: The CCD ROCIP Contractors Pollution coverage is limited solely to Work performed at the Project Site and for Projects specifically listed on the Policy.

Contractors Pollution Insurance Claims Chargeback. A claims charge-back will be assessed for the amount of any loss payable under the Contractors Pollution, up to the first $5,000 of any loss will be paid by Contractor. This includes all expenses or claim payments incurred by the ROCIP Insurer for losses attributable to the Contractor's work, acts or omissions, or the work, acts or omissions of any tier of subcontractor. Contractor may elect to pass this charge through to any responsible subcontractor but in no event may require total subcontractor reimbursement in excess of $5,000.

Note

The descriptions above provide a summary of coverages only. Contractors and Subcontractors should refer to the policies for actual terms and conditions.

Builders Risk:

Property Excluded: Land/Land Values, Water, Vehicles, Damage To Existing Property (unless specifically endorsed), Contractor Plant & Equipment, Prototypical or Used Equipment As Respects Testing, Property Located At Other Than The Project Site Except While In Transit Or Temporary Offsite Locations, And Others Per Policy Form

Limits of Insurance:	$All ROCIP Projects	Policy Limit/Any One Occurrence
Sublimits:	Included in Policy Limit	Water Damage (includes surface water, back up of sewers and drains)
	$TBD	Damage to Existing Building
	Included Policy Limit	Flood
	Included in Policy limit	Earthquake
	$10,000,000	Property in Storage Off-Site
	$10,000,000	Property Temporarily Off-site
	$10,000,000	Property in Transit (Road, Rail or Inland Waterway, including Place of Storage and Accommodation and all related Loading and Unloading
	20% of Loss/$10,000,000 Maximum	Debris Removal
	125%	Escalation Clause
	$2,500,000	Fire Fighting and Service Charges
	$10,000,000	Law or Ordinance (Coverage B and C only); for Coverage A (building) is included within the Project Value)
	$5,000,000	Plans, Drawings and Documents
	$5,000,000	Reproduction of Computer Records
	20% Coinsurance, subject to a Maximum Limit of $10,000,000	Extra Expense
	20% of Loss subject to a Maximum of $20,000,000	Expediting Expense
	$2,000,000	Temporary Repairs
	$2,000,000	Professional Fees
	$500,000	Loss Minimization Expenses and Preventative Measures
	$1,000,000	Pollution Clean Up Costs from land and water
	$500,000	Continuing Hire Costs
	$100,000	Claims Preparation Costs

Deductibles	$25,000 Per Occurrence except $50,000 Flood $50,000 Earthquake In the event that more than one Deductible could apply, the largest single Deductible only will apply
Coverage Extensions:	• Beneficial Occupancy Clause – Property taken into Use Clause • Automatic Reinstatement Clause – without additional premium • Repeat Tests Clause • Civil or Military Authority Clause • Other Interests Clause
Other Terms and Conditions:	• Occurrence Definition – 72 hour period • Primary Insurance Provision • Concealed Damage Clause 50/50 • Permissions Clause • Claims Procedures Clause • Interim Payments Clause • Multiple Insureds' Clause (LEG MIC Excluding paragraph v2) • Cancellation Clause – Insurer may cancel only for non-payment of premium • Inadvertent Errors and Omissions Clause • Reasonable Precautions Clause • Dispute Resolution Clause
Exclusions (including but not limited to):	• Construction Defects (LEG 2/96) Clause • Contractors' Plant and Equipment • Wear and Tear or Gradual Deterioration (with exception) • Corrosion and Erosion (with exception) • Normal Upkeep • Penalties and Consequential Loss • Money • Inventory Loss (including mysterious disappearance) • Aircraft • War and Civil War • Political Risks • Radioactivity (CL 370) • Electronic Data (Computer Virus, Corruption or Alteration, etc.) with exception for if loss is caused by an insured peril • Deliberate Acts

Coverages: The City and County of Denver shall provide Builder's Risk insurance on an "all risk" basis, and covering the work and all materials and equipment to be incorporated therein, including property in transit or elsewhere, subject to certain sub-limits, and insuring the interests of the City and County of Denver, the Contractor, subcontractors, and material suppliers. This insurance shall not cover any personal property of the Contractor or Subcontractors, including tools, equipment, scaffolding, staging towers, and forms, rented or owned by the Contractor or any Subcontractor, the capital value of which is not included in the cost of the Work. Builder's Risk insurance will not provide coverage against loss by theft or disappearance of any materials (unless the materials are to be incorporated into the Project), tools, or equipment of the Contractor or any tier of Subcontractor, or any other person furnishing labor or materials for the Work. Contractor agrees to indemnify, defend, and hold the City and County of Denver and its officers, agents, and employees, harmless from any such loss, theft, or disappearance.

A **claims charge-back** will be assessed for the amount of any loss payable under the **Builder's Risk Policy**. The first $5,000 of any such occurrence will be paid by Contractor. This includes all expenses or claim payments incurred by the Insurer for losses attributable to the Contractor's Work, acts or omissions, or the Work, acts or omissions of any tier of subcontractor. Contractor may elect to pass this charge through to any responsible subcontractor but in no event may require total subcontractor reimbursement in excess of $5,000.

Note

The descriptions above provide a summary of coverages only. Contractors and Subcontractors should refer to the policies for actual terms and conditions.

ROCIP Termination or Modification

The City and County of Denver reserves the right to terminate or modify the CCD ROCIP or any portion thereof. The City and County of Denver exercises this right, Enrolled Contractors and Subcontractors of any tier will be provided notice as required by the terms of their individual Contracts. At its option, the City and County of Denver may procure alternate coverage or may require Contractors and Subcontractors of any tier to procure and maintain alternate insurance coverage at the costs that you identified in your bid.

Section 5

Required Coverage for Contractors and Subcontractors

Contractors and Subcontractors of any tier are required to maintain coverage to protect against losses that occur away from the Project Sites or that are otherwise not covered under the CCD ROCIP.

Contractors and Subcontractors of any tier are required to maintain insurance coverage that protects the City and County of Denver from liabilities arising from the Contractor's and Subcontractor's operations performed away from the Project Sites and for types of coverage not provided by ROCIP, and for operations performed in connection with the Contract by those who are Ineligible. Contractors and subcontractors are solely responsible for monitoring these matters.

See Section 8 for sample Certificate of Insurance form.

Verification of insurance may be submitted in the form of a Certificate of Insurance on a standard ACORD Form 25-S. A sample of an acceptable Certificate of Insurance is provided in Section 8. Please note requirements for a thirty (30) day notice of cancellation, waiver of subrogation and additional insured status. Also, Contractor's and Subcontractor's insurance must be primary and non-contributory.

Contractors are responsible for verifying and monitoring the adequacy of insurance required to be maintained by Subcontractors and Ineligible parties' with whom the Contractor contracts. The City and County of Denver reserves the right to disapprove use of Subcontractors unable to meet any insurance requirements. Enrollment information and Certificates evidencing compliance with any and all insurance requirements shall be sent to the CCD ROCIP Administrator.

Prior to mobilization and within 30 days of any renewal, change or replacement of coverage, Contractors and Subcontractors shall submit to the City and County of Denver and the CCD ROCIP Administrator a Certificate of Insurance evidencing the coverage, limits and deductibles as specified in this section.

The limits of liability shown for the insurance required of the Contractor and Subcontractors are minimum limits only and are not intended to restrict or limit the liability imposed on the Contractor and Subcontractors for Work performed under their Contract.

Contractor and Subcontractor Provided Coverages

Automobile Liability and Automobile Physical Damage

All Contractors and Subcontractors shall provide evidence of automobile liability. CCD ROCIP does not cover automobile liability.

Covering all owned, leased, hired and non-owned automobiles, trucks and trailers with coverage no less broad than that of the ISO Commercial Business Auto Policy in limits not less than **[$1,000,000] combined single limit** each accident for bodily injury and property damage and automobile physical damage. Coverage shall apply both on and away from the Project Sites.

All hazardous waste or materials transporters including but not limited to any contractor or subcontractor (including fuel, oil, gasoline) must carry a minimum of $5,000,000 combined single limit and show evidence of MCS90 Endorsement.

Workers' Compensation and Employer's Liability

Eligible Contractors and Subcontractors shall provide evidence of workers' compensation insurance for off-site activities, including design work.

Ineligible Contractors and Subcontractors shall provide evidence of workers' compensation applicable to the Project.

Part One -	Workers' Compensation:	Statutory Limit
Part Two -	Employer's Liability	Annual Limits: Contractor
	Bodily Injury by Accident, each Accident	$100,000
	Bodily Injury by Disease, each Employee	$100,000
	Bodily Injury by Disease, Policy Limit	$500,000

Commercial General Liability/Umbrella Liability

Ineligible Contractors and shall provide evidence of general liability insurance for the Project and must name the City and County of Denver, the Owner of the Project Sites and other parties as additional insured's to the policy

PRIME CONTRACTOR REQUIREMENTS	Limits of Liability
General Aggregate	$2,000,000
Products/Completed Operations Aggregate	$2,000,000
Personal/Advertising Injury Aggregate	$1,000,000
Each Occurrence Limit	$1,000,000

SUBCONTRACTOR REQUIREMENTS*	Limits of Liability
General Aggregate	$2,000,000
Products/Completed Operations Aggregate	$2,000,000
Personal/Advertising Injury Aggregate	$1,000,000
Each Occurrence Limit	$1,000,000

*Please refer to your Insurance Requirements as they may differ from these requirements

Coverage shall be on an occurrence form and apply to bodily injury and property damage for operations (including explosion, collapse and underground coverage), independent contractors, products and completed operations. Limits can be provided by a combination of a primary Commercial General Liability policy and Excess or Umbrella Liability policy.

Watercraft and Aircraft Liability

Should watercraft or aircraft of any kind be used by a Contractor or Subcontractor of any tier, or by anyone else on its behalf, Contractor or Subcontractor shall maintain or cause the operator of the watercraft or aircraft to maintain Liability insurance with a minimum combined single limit for bodily injury and property damage including passengers in an amount agreed upon in writing with the City and County of Denver.

THE CITY AND COUNTY OF DENVER does not provide professional liability insurance for Contractors or Sub-contractors.

Professional Liability

All contractors with any design responsibility must provide professional liability insurance or require their design consultants provide appropriate insurance covering liability arising out of design errors and omissions with a limit of not less than $1,000,000 per claim for each design Contractors. All such policies must be primary and non-contributory with a waiver of subrogation.

Contractor's Equipment

All Contractors and Subcontractors of any tier must provide a Certificate of Insurance evidencing coverage or replacement cost of Contractor's or Subcontractors [tools and] equipment, with a waiver of subrogation in favor of the City and County of Denver, and all CCD ROCIP enrolled contractor and subs of any tier.

Contractor and Subcontractor Responsibilities

Throughout the course of the Project, Contractors and Subcontractors will be responsible for the reporting and maintaining of certain records as outlined in this section.

The Contractor and all Subcontractors of any tier are required to cooperate with the City and County of Denver, its Broker, CCD ROCIP Administrator and insurance companies, in all aspects of CCD ROCIP operation and administration. Responsibilities of the Contractor and Subcontractors of any tier include:

- Enrolling in CCD ROCIP
- Including CCD ROCIP provisions in all subcontracts as appropriate
- Providing timely evidence of off-sites insurance to and the CCD ROCIP Administrator
- Notifying the CCD ROCIP Administrator of all subcontracts awarded
- Maintaining and reporting payroll records
- Cooperating with the City and County of Denver, its Broker, the CCD ROCIP Administrator's and insurance companies' requests for information
- Complying with insurance, claim and safety procedures
- Notifying the Broker and the CCD ROCIP Administrator as required by contract of any insurance cancellation or non-renewal (Contractor- and Subcontractor- required insurance)

Contractor Bids

See Section 8 for sample forms that can help identify your insurance costs. See Section 2 for information on contacting the CCD ROCIP Administrator.

Insurance is provided for all Eligible, Enrolled Contractors and Enrolled Subcontractors of any tier under CCD ROCIP for Work performed at the Project Site. Contractor bids and Change Orders should exclude insurance costs for these coverages. Section 8 of this CCD ROCIP Insurance Manual contains information on how to enroll e and submit information to the CCD ROCIP Administrator via an on-line system (VUE) to that the Contractor will be required to submit to the CCD ROCIP Administrator after award of the Contract to document insurance costs excluded by the Contractor for this Project.

Each bidder of every tier is required to exclude from its' bid price, its normal cost for the insurance coverages to be provided by the City and County of Denver under the CCD ROCIP Program. All subsequent change orders will also exclude these costs. Excluded insurance costs are subject to verification and documentation by the CCD ROCIP Administrator.

Note

Before estimating insurance costs or contacting your insurance representative about excluding the Project from regular coverage, you should read this manual in its entirety.

Enrollment

See Section 8 for sample ROCIP forms

Each Contractor shall provide details about itself and its subcontractors as necessary to enroll in the CCD ROCIP. **The City and County of Denver will need all of the information requested to enroll the project, your declaration rate pages and deductible endorsement on CGL policy must be completed and submitted to the CCD ROCIP Administrator prior to mobilization to obtain coverage under the CCD ROCIP.**

The CCD ROCIP Administrator must be notified of each separate contract and all change orders.

When a Contractor or Subcontractor is accepted into CCD ROCIP, they will receive a Certificate of Insurance acknowledging that they have been enrolled in CCD ROCIP.

Note: Enrollment is Mandatory - Not Automatic

Enrollment into the CCD ROCIP is required, but not automatic. Eligible Contractors and all Eligible Subcontractors of any tier MUST complete the enrollment forms and participate in the enrollment process for CCD ROCIP coverages to apply. Access to the Project Sites will not be permitted until enrollment is complete.

Assignment of Return Premiums

The cost of the CCD ROCIP insurance coverages will be paid by the City and County of Denver. The City and County of Denver will be the sole recipient of any return CCD ROCIP premiums or dividends. All Enrolled Contractors and Subcontractors of any tier shall assign to the City and County of Denver all adjustments, refunds, premium discounts, dividends, credits or any other monies due from the CCD ROCIP insurers. Contractors shall assure that each Enrolled Subcontractor of any tier shall execute such an assignment. The *Insurance Application* that the Contractor completes on-line will be used for this purpose.

Payroll Reports

Each Contractor and Subcontractor of any tier must submit **Payroll Reports online via the CCD ROCIP Administrator's website** identifying labor-hours and payroll for all work performed for the Project. The monthly labor-hours and payroll reports should include supervisory and clerical personnel on-sites and shall certify all Work performed at or emanating directly from the Project Sites.

Note
Each Contractor and Subcontractor must submit payroll through CCD's LCP portal on conjunction with remitting to the CCD ROCIP Administrator.

This information will be used to provide the insurance companies with information required to determine the City and County of Denver premium**.** *Instructions are noted under Section 8 of this manual.* The Contractor and each Subcontractor must register first and enroll online. *See Section 8 of this manual for instructions.*

Once the enrollment application is approved, ***an E-mail will be sent to each Contractor and Subcontractor providing each Contractor and Subcontractor a Certificate of Insurance as evidence of participation in the CCD ROCIP. You will be required to log-in monthly to the CCD ROCIP Administrator III's website and submit monthly payroll.***

Note: Separate Reports Required
A separate Payroll Report is required for each Contract for Work you are performing.

Insurance Company Payroll Audit

Each Enrolled Contractor and Subcontractor is required to maintain payroll records for the Project in accordance with the *Basic Manual of Rules, Classifications, and Experience Rating Plan for Workers' Compensation and Employer's Liability Insurance*. Such records shall allocate the payroll by Workers' Compensation classification(s) and shall include all payrolls as defined by the State of Colorado state manual rules.

It is important that you properly classify payrolls, as these will be reported to the rating agency. All Enrolled Contractors and Subcontractors of any tier shall make available their books, vouchers, contracts, documents, and records, of any and all kinds, to the auditors of the ROCIP insurance carriers or the City and County of Denver 's representatives at any reasonable time during the policy period, any extension, or during a final audit period as required by the insurance policies.

The Insurance Company has the right to correct and reclassify payroll.

Note

Failure to submit the payroll reports as required may result in the withholding of payments until required documentation is received.

Completion of Work

When an Enrolled Contractor or Subcontractor of any tier has completed its Work, each Enrolled Contractor or Subcontractor of any tier shall complete must login into the CCD ROCIP Administrator's website and complete the close out page.

Final Payment will not be released by the City and County of Denver until all necessary forms have been submitted to the CCD ROCIP Administrator.

Claims Reporting

A claims kit will be provided to all Contractors. It will include details about claim reporting and is intended for use at the Project Sites.

Each Contractor and Subcontractor of any tier shall follow the claims procedures as established by the CCD ROCIP Administrator. Contractors and Subcontractors of any tier agree to assist and cooperate in every manner possible in connection with the adjustment of all claims and demands in which the City and County of Denver Insurer(s) is called on to adjust or defend. Please refer to **Section 7** of this Manual.

Contractors will be provided loss information for their respective claims. Contractors are encouraged to participate in the claims management process. The City and County of Denver has ultimate authority in any claim settlement matter.

Each Contractor and Subcontractor will have the full right to participate in the management and mitigation of their own workers' compensation claims and any financial information regarding each individual contractor's workers' compensation claims will be provided.

A Manual establishing minimum standards for Contractor and Subcontractor of any tier safety programs will be provided to all Contractors and Subcontractors of any tier.

Safety Procedures

Each Contractor and Subcontractor of any tier is required to establish a written safety program and to provide a full-time Safety Manager or designated safety representative who shall be on sites when any Work is in progress. Minimum standards for such programs are outlined in the CCD ROCIP Safety Program Manual.

.Off-Sites Locations

The Contractor and Subcontractor of any tier are responsible for applying for approval to have off-site locations covered. The Contractor shall notify the City and County of Denver of the need and shall request approval of such location. The request should include the location, address, and description of the Project Sites, the type of use to which it will be put, and the duration of the work to be performed at such location. The off-site location must be dedicated to the Project.

Coverage is not automatic until confirmed by the CCD ROCIP Administrator.

Change Order Procedures

Change orders will also be priced by the Contractor and its Subcontractors to exclude their cost of insurance for the coverages provided by CCD ROCIP.

Close Out and Audit Procedures

When a Contractor and/or an associated Subcontractor of any tier has completed its Work at the Project Site(s) and will no longer have on-site workers, the Contractor shall notify The CCD ROCIP Administrator of final payroll by clicking the box on the Monthly Payroll Screen. Then the Contractor should go into the Close out Tab and verify total payroll and final contract value and complete close out information.

Section 7

Claim Procedures

This section describes basic procedures for reporting various types of claims: workers' compensation, liability, and damage to the Project.

Claim Contacts

The primary Claim contact for the project will be:

Kendall Trump, CIC, ARM-e
Claim Consultant
Arthur J. Gallagher Risk Management Services, Inc.
303-889-2570
kendall_trump@ajg.com

Workers' Compensation Claims

A Claims Reporting Kit will be provided to all Contractors. It will include details about claim reporting and is intended for use at the Project Sites.

The main responsibility for any Contractor or Subcontractor is first to see that any injured worker receives immediate medical care. Next, you should contact the Prime Contractor immediately in the event of a serious injury or accident**.** An Employer's First Report of Injury and the Supervisor's Report of Injury form must be completed within 24 hours and submitted in accordance with claims procedures as noted on **page 24**. Each Contractor or Subcontractor is responsible for providing to their injured employee a WC-1 form which also must be completed by the injured employee.

The claims kit will be provided to all Enrolled Contractors and Subcontractors of any tier. These packets will include claim forms. Additional claim forms will be available by contacting the CCD ROCIP Administrator.

The City and County of Denver 's Insurer will arrange with preferred, local medical providers for treatment of all minor or non-life threatening injuries. The name and location of such preferred, local medical providers are provided in the claim kits as well as a poster to be posted at Project Sites.

Enrolled Contractors of any tier must designate a representative called the Contractor Safety Supervisor at the Project Sites to take injured employees to the medical center, and to report the claim. This individual should remain with the injured employee at the medical center while such employee is being treated. The treating physician should provide a written description of whether or not the injured employee can return to work, a list of restrictions if any, and the estimated length of time such employee can stay on modified duty.

The City and County of Denver Insurer will arrange for local 911 emergency ambulance services for response to any serious, traumatic, life-threatening injuries and will provide information to be posted at the Project Sites and in the claims packet.

Carrier: TBD
Worker Compensation Claims Reporting Information

TBD has created a customized claim report kit to report claims. Below is a link that gives instant access to loss reporting instructions, claim forms and other information. In addition, you can report the claim via e-mail, fax or by telephone by calling the number noted below:

Make sure your Policy # is included in Forms or Cover Sheets.

Report Workers Compensation Claims

Claims are to be reported via TBD website which has specifically been set up for CCD ROCIP.

To access the claims reporting kit, please copy the link below and paste it into your browser window:

Claim Reporting is on the right side after your enter the website. Click on "Report a Business Claim Online". Follow the prompts. Any questions, please contact Kendall Trump at Gallagher at 303.889.2570 for assistance.

You may report a claim by calling 1 TBD

Carrier: TBD
Worker Compensation Claims Reporting Information (Continued)

Reporting via e-mail:

You may e-mail the First Report of Injury to the following E-mail address; however, please note the following restrictions on the E-mail Notice of Loss:

E-mail: TBD

Additional restrictions on this e-mail program include the following:

- Send notice of loss when emailing us (no photos, color graphics, or shaded attachments)
- Send a basic attachment format that does not contain digitized logos, unstable formatting, or hyperlinks
- Any changes to the email format or types of attachments will require additional approval on TBD end

Also, the Colorado First Report of Injury form *(See page 51 and the separate worksheet provided)* that is currently being used for new claim reporting does not include fields for Location Code, policy # etc. We have attached a TBD Workers' Compensation Worksheet for reporting claims to TBD. There are fields for the Location Code and your Policy #. This form can be used for E-mail reporting. TBD will file the Colorado First Report of Injury electronically with the State.

Medical Bills

Please send all medical bills to the following TBD office:

Medical Bill Inquiries

Please call TBD; however, contacting the adjuster assigned is more efficient.

Following are screen shots to assist in navigating the website.

CCD ROCIP – WORKERS COMPENSATION CLAIMS REPORTING - TBD

To access the claims reporting kit, please copy the link below and paste it into your browser window:

This is the Frist Page of TBD Website to Report Claims. Please see the right hand side and click on Report Business Claim Online

CCD ROCIP – WORKERS COMPENSATION CLAIMS REPORTING - TBD

CCD ROCIP – WORKERS COMPENSATION CLAIMS REPORTING - TBD

After you hit the Continue button, you will be direct to this report your loss screen. Click on the drop down arrows to choose the appropriate question being asked.

Click on the Type of Claim you will be reporting – Workers Compensation.

O the drop down box to select who are you e in relation to the loss (which is Account/Insured)

On the Date of loss you can type the date of loss in the boxes or you can click on the small gray box and a calendar will pop up.

Next, you will be asked whether or not this is a Longshore/Jones Act Loss – Answer "No".

Next, enter the state of Injury – Colorado

Employer input the injured workers' social security number.

Hit Continue:

CCD ROCIP – WORKERS COMPENSATION CLAIMS REPORTING - TBD

A window will appear asking for your policy or account number.

Example policy # for Workers' Compensation: TBD. *You do not need to include your full policy number when reporting a claim online. Just input the 80 to 10 digits that are highlighted.*

Click Continue when you input your policy #

CCD ROCIP – WORKERS COMPENSATION CLAIMS REPORTING - TBD

You will then be asked additional information about you, the employee and the incident.

You only need to fill out any questions with a red asterisk next to them; however, the more information you can provide the better.

Begin by filling out your information, along with the subsidiary information.

Continue by filling out information on the injured worker, and his or her job. Again, please remember you only are required to fill out the questions next to the red asterisk, however you are encouraged to complete as many questions as you know the answers to.

You will need to fill out information regarding the loss itself, including a brief free form description of how the loss occurred.

A very important question you will be asked is regarding whether or not you question the injury. This will help our claim offices determine whether the claim needs to be handled by our investigative claim team.

Complete the additional questions and scroll to the bottom

CCD ROCIP – WORKERS COMPENSATION CLAIMS REPORTING - TBD

At the bottom you will see the following options.

Here you can click the print button to print the information you filled out for your records.

Continue will send the claim to the TBD claim office for assignment.

You can click save and call us for help if you have any questions regarding reporting your claim or need to gather additional information in order to complete the questions with the red asterisk.

You can click cancel if you would prefer not to report the claim online at this time.

CCD ROCIP – WORKERS COMPENSATION CLAIMS REPORTING - TBD

Once you have clicked Continue to report the loss you will see the following screen. This screen provides you with the claim number and the contact information for the claim center that will be handling your claim.

Liability Claims

Accidents at or around the Project Sites resulting in damage to property of others (other than the Work itself), or personal injury or death to a member of the public, must be reported immediately to the Prime Contractor, City and County of Denver and Gallagher. The General Liability Reporting form found in the **Claim Kit** shall be completed and emailed, faxed or phoned within 24 hours of injury or damage.

Contractors and Subcontractors of any tier shall not voluntarily admit liability and shall cooperate with the City and County of Denver, Gallagher and the Insurer representatives in the accident investigation.

Builder's Risk Claims

Report any damages to your Work or the Work of any other Contractor/Subcontractor to the Prime Contractor, City and County of Denver Assigned Project Manager, and Gallagher. In addition, complete the Builders Risk Loss Reporting form and submit it to Gallagher.

Automobile Claims

No coverage is provided for automobile accidents under the CCD ROCIP. It is the sole responsibility of each Contractor and Subcontractor of any tier to report accidents involving their automobiles to their own insurers.

HOWEVER, all accidents occurring in or around the Project Sites must be reported to the Prime Contractor, City and County of Denver, Assigned Project Manager, and Gallagher. These accidents may be investigated with regard to any liability arising out of the Project construction activities that could result in future claims (e.g. due to the conditions of the roads, etc.) Each Contractor and Subcontractors of any tier shall cooperate in the investigation of all automobile accidents.

Pollution Claims

Contractors and Subcontractors of any tier shall **immediately** notify the Prime Contractor, City and County of Denver, Assigned Project Manager and Gallagher of any known or suspected pollution incidents.

Section 8

Enrollment Procedures and Requirements – via Administrator's On-Line System

Prime Contractor [Manager]

Project: [Enter Project Name]

This section contains information on enrollment procedures and requirements including enrolling via the CCD ROCIP Administrator's website and, reporting payroll on-line and other administration of the CCD ROCIP.

Note

For assistance, please contact:

Heather Lawson – CCD ROCIP Administrator ,
Telephone Number: 314-800-2205
Email: heather_lawson@ajg.com

CCD ROCIP Enrollment Procedures and Requirements

EVERY CCD ROCIP PARTICIPANT MUST COMPLETE THE CCD ROCIP ENROLLMENT ONLINE.

IMPORTANT! YOUR PROJECT NO. IS REQUIRED WHEN ENROLLING

1. Enroll online at: https://ajg.vuewrapup.com/contractorportal. You must register first if you do not already have a user login. Once you register and login click "New Enrollment" and when you are prompted for a Project Code use **your Project No.**

2. Once you complete the online enrollment upload a certificate of insurance to the documents section. Please find a sample certificate after this page. The certificate must be in accordance with the CCD ROCIP enrollment provisions in the General Conditions evidencing primary Auto Liability, Workers' Compensation, and General Liability for Project-Related Operations performed away from the CCD ROCIP Project Site. *Contact your Insurance Agent for this certificate (a sample is included). It is your responsibility to notify your Insurance Agent to exclude all work to be done at this Project Site from your regular General Liability and Workers' Compensation policies.*

3. You must also upload a copy of your Workers Compensation, General Liability, and Excess Liability rating and declaration pages from your primary insurance policy.

4. Arthur J. Gallagher will send a Certificate of Insurance evidencing your coverage under the CCD ROCIP program. You should keep this certificate as evidence of your participation in the CCD ROCIP. It may be required by your regular insurance company to exclude this job site from your regular policy.

5. Once you begin work on site you must log in on a **monthly basis** and submit your monthly payroll. Click the box by the contract number and click the "Payroll" button at the top of the page. Verify that the dates the system pulled in are correct before saving your monthly payroll. If you have multiple class codes and are only reporting payroll under one of them for any given month you must enter $0 for those class codes that you do not have payroll for.

6. When you are have completed your work on the Project, you must login into the system and complete the closeout page. Click the box by your contract and click "Close Out" at the top of the page. You will be asked to reconcile your monthly reported payroll and provide your final contract value.

   If you have any questions or concerns please don't hesitate to contact me:

   Heather Lawson
   314-800-2280
   Heather_lawson@ajg.com

On-line Enrollment Instructions

Enrolling Through the Online Portal

1. In your web browser, open the AJG Wrap-up Management Portal URL (https://ajg.vuewrapup.com/contractorportal). This will open the portal login screen.

If you have never registered with the AJG Wrap-up Contractor Portal nor received a login for ajg.vuewrapup.com, follow steps 2-4.

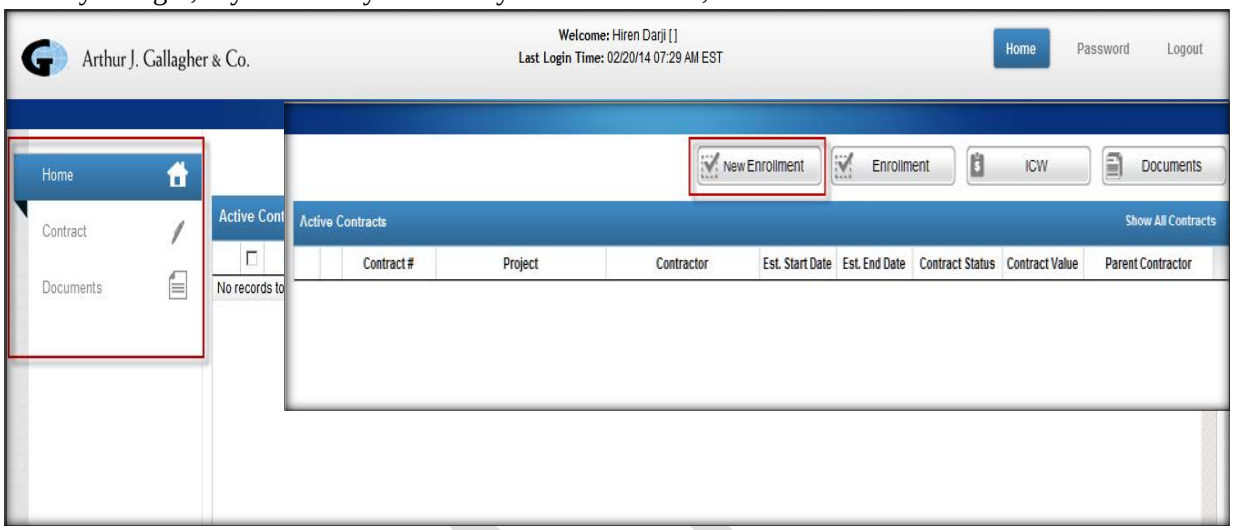
If you are already registered, proceed to step 5.

2. Click the Register Me link at the bottom right hand corner of the login box.

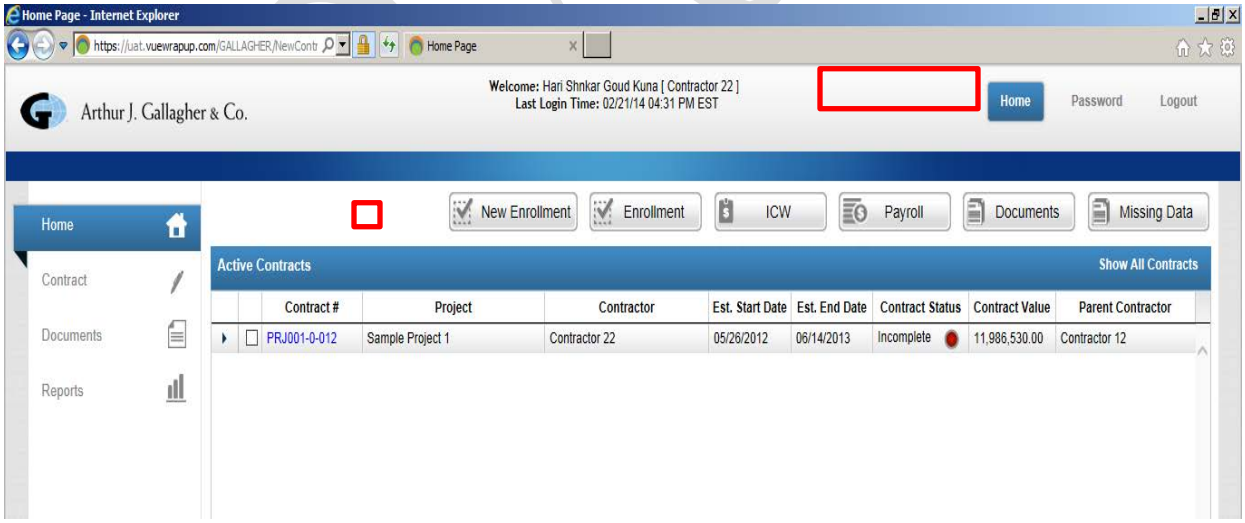
3. Fill in the form with your first name, last name, email ID (email address) and enter the User ID you would like to use. Your User ID can be any User ID you will easily remember, such as your first initial and last name (preferred), your company name, or your email address, and must be unique. Password may contain letters, numbers and symbols. All fields are required.

4. When your registration has been received successfully, you will see the message "User ID and Password are created. Please click here to login to Contractor Portal" in red. Click the link to be redirected to the login page where you can login to the portal to complete your enrollment. You will also receive an email with your User ID and Password for your records.

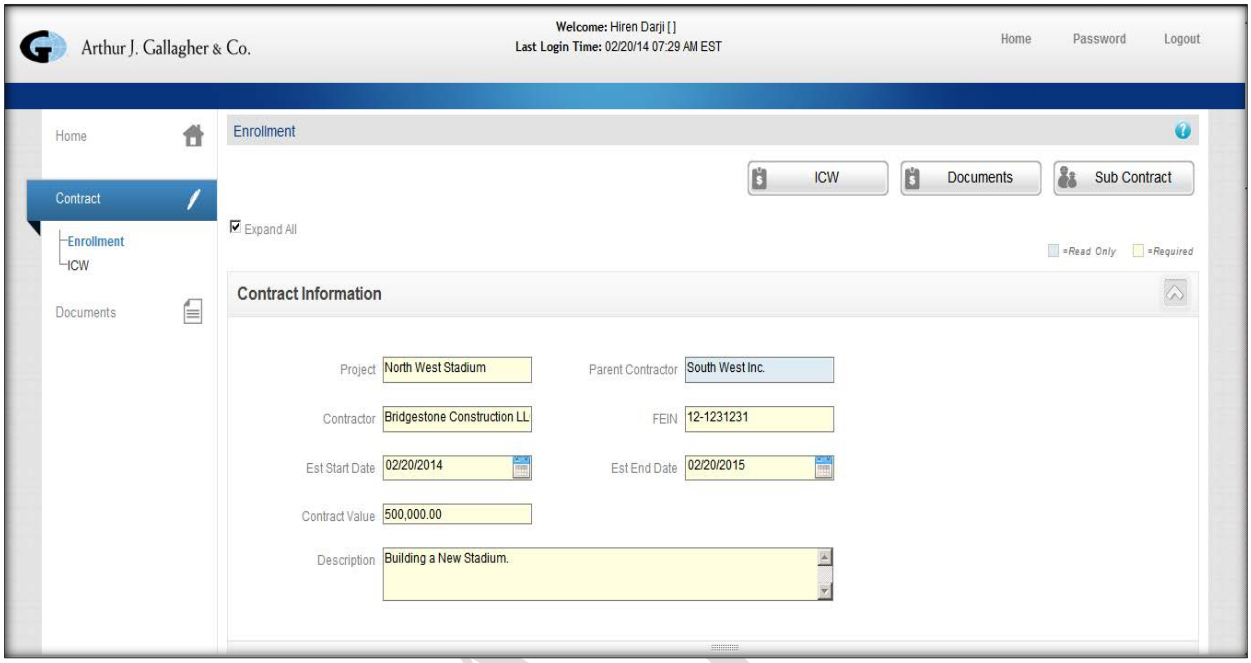
5. When you login, if you do not yet have any contracts added, click the button "New Enrollment".



If you already have the contract in the system, click the checkbox next to the contract you need to enroll or complete enrollment, then click the Enrollment button. If you do not see your contract, add a New Enrollment and **use project code [ ]**



6. You will be brought to the Enrollment Screen.

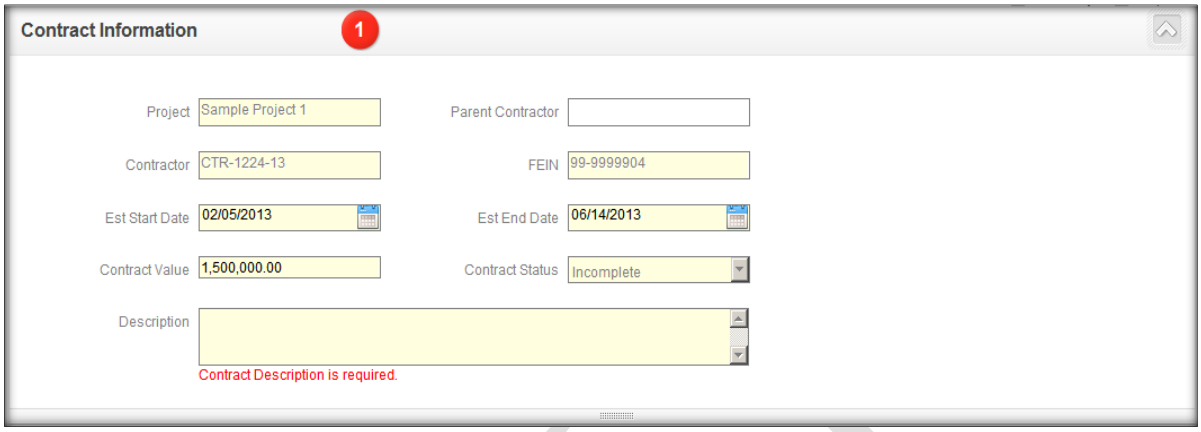


The Enrollment Screen includes the following sections, each of which can be expanded or collapsed for ease of review:

a. Contract Information
b. Address
c. Contact
d. Estimated Payroll
e. Insurance Information

7. Fill in each section with your information to the best of your ability. Fields highlighted in yellow are required. If you do not know the information for a required field, enter an X, or if a specified format is required such as a date, enter your best estimate.
   a. For a new enrollment, all fields shown should be filled in.
   b. If you have previously started an enrollment or if a contract has been added to your portal by an administrator, you may not be able to edit some fields. Move on from those and fill in all the other fields as completely as possible. (If you notice a mistake in a non-editable field, contact your administrator).

8. In the Contract Information section, please enter your contract Estimated Start Date, Estimated End Date, Contract Value and Description of Work.



9. In the address section, enter a primary address by filling in the fields for address type, street address, city, state, zip, and checking the checkbox "Primary". You must enter at least one address and it must be marked as primary.

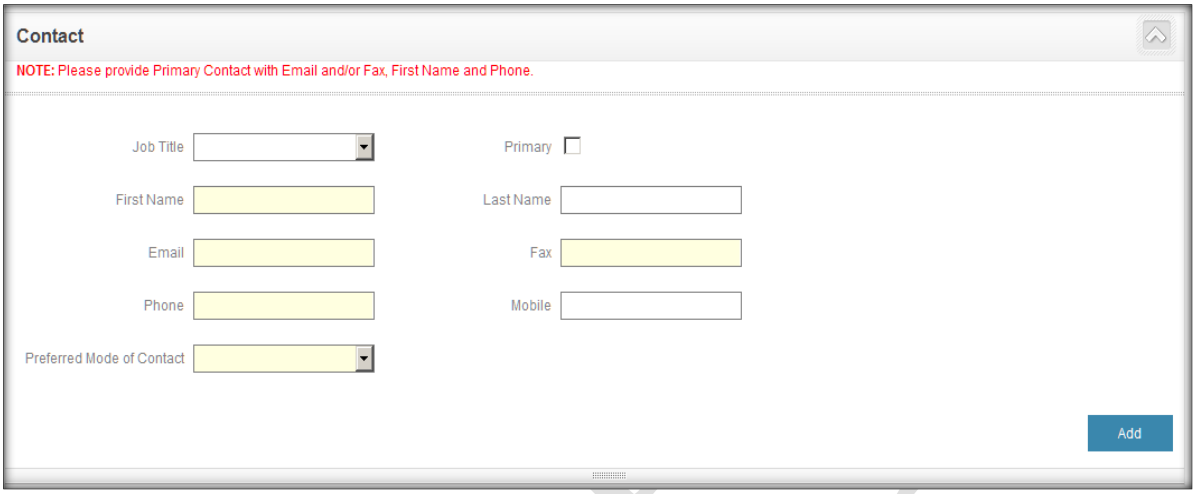
a. To add a secondary address, click the Add button in the lower right hand corner of the address section. This will open another address section.

b. To mark a different address as primary, first uncheck the Primary checkbox in the address originally checked as primary, then check the primary checkbox in the new primary address. If you check the Primary box in a different address first, you will get an error message. You first must un-check the original checkbox and then check the new checkbox.

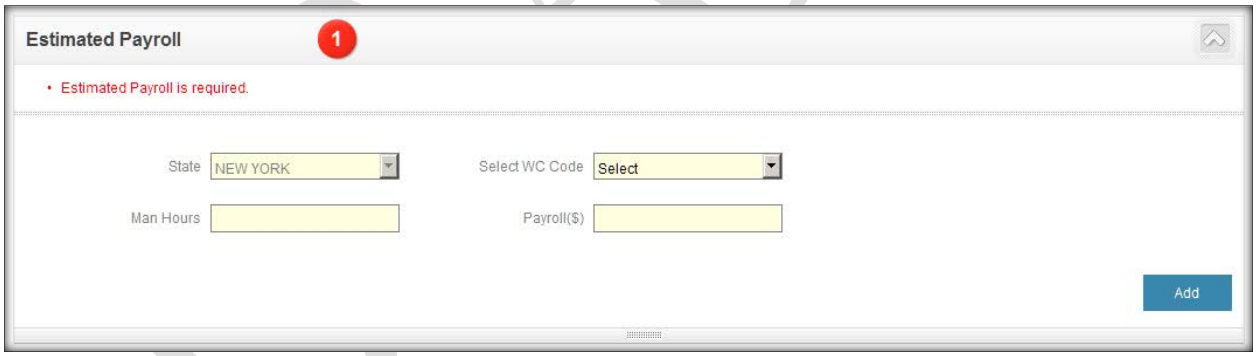
c. To delete an address, click the delete button at the lower right hand corner of the section containing that address. (Delete will only show when there is more than one address added.)

d. Note: You cannot delete an address that has already been approved by the administrator. If you try to delete an address which has been approved by AJG Wrap-up Administrator, then you will get the error message: "You cannot delete Address approved by administrator. Please contact AJG Wrap-up administrator."

10. In the Contact section, add your contacts. You must enter at least one contact and it must be marked as primary. You can also add additional contacts. The same rules around marking as primary, adding and deleting apply for Contact as for address. Please see the address section above for more details.
    a. You must provide a value for your corresponding preferred mode of contact. For example, if you select email as your preferred method of contact, you must provide an email address.



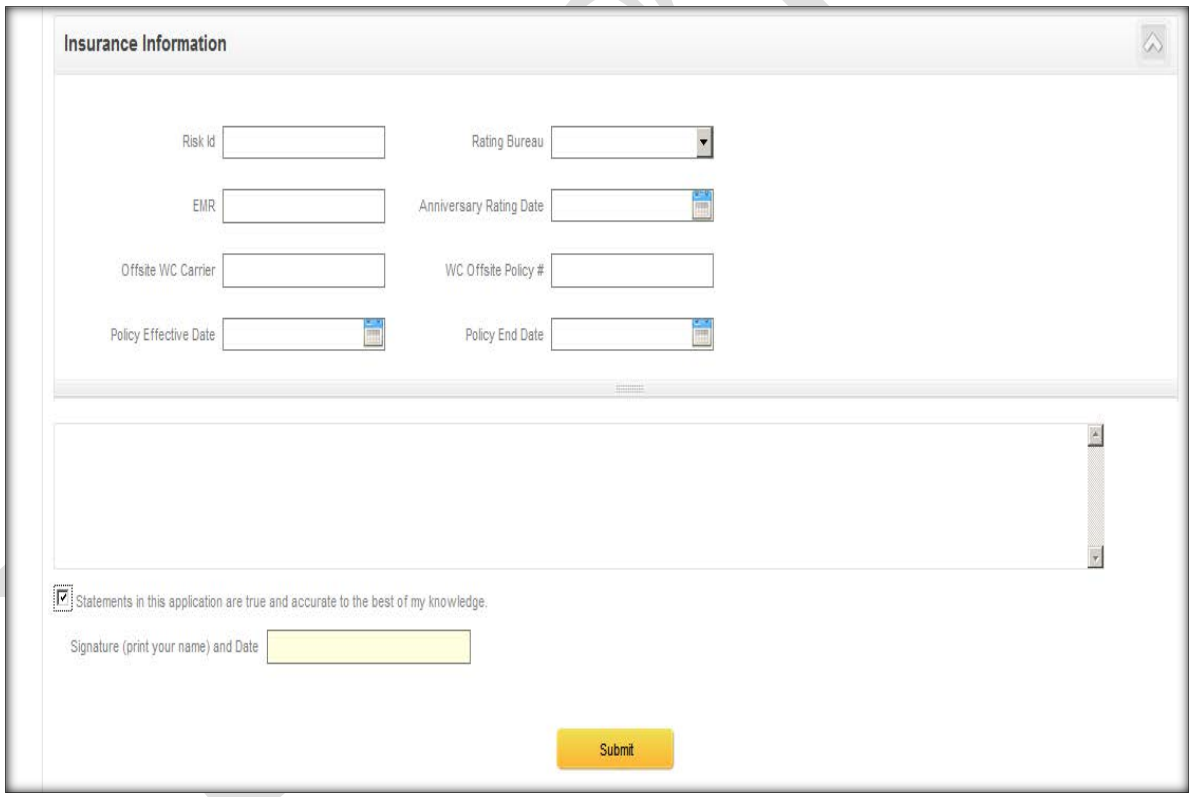
11. In the estimated payroll section, you must enter estimated payroll for at least one worker's compensation class code. For each class code, select the class code, enter the man hours and the payroll amount.



    a. If editing an existing enrollment or completing an enrollment for an administrator-added contract, the state will be driven off of the project state and will not be editable.
    b. To add another class code, click Add. Once there is more than one class code, the Delete button will also appear, allowing you to delete other records if needed.

12. The Insurance Information section is required, however items a. and b. below are not mandatory (please enter that information if available).
    a. *Risk ID # (This is the ID # assigned t*o the Contractor by the Rating Bureau that compiles and calculates the EMR).
    b. Rating Bureau (The organization that compiles Claims history and Payroll to calculate the EMR).
    c. EMR value for current year.
    d. Anniversary Rating Date (MM/DD/YYYY) by when new EMR shall come into effect).

    (Note: Contact your Broker/Producer on your worker's compensation policy to obtain these details if you do not have them.)
    e. Offsite WC (Worker's Compensation) Carrier Name
    f. WC (Worker's Compensation) Offsite Policy Number
    g. Policy Effective Date (mm/dd/yyyy) - Start date of the Policy
    h. Policy End Date (mm/dd/yyyy) – End date of the Policy



13. Before you submit your enrollment information, you must check the confirmation checkbox. (Note: The text in your portal may differ from what is shown in the above screenshot.) After you verify the information is correct, check the checkbox.
    a. Once this checkbox is checked, Signature (print your name) and Date field will be visible. Please add details for sign and date.
    a. If Verification checkbox is not checked before submitting enrollment, then system will give message as "You have not verified the above information."
    b. If Signature is not entered before submitting Enrollment, then system will give message as "Signature is required."

Note:

1. If anything is incomplete, a red circle with the number of missing items will be shown on each section.
    a. For example, if five required data points are missing in the Insurance Information section, the header shows red circled count for the # of missing data points.
2. Once your Contract is Pending / Enrolled, you cannot make changes to the enrollment for the contract.

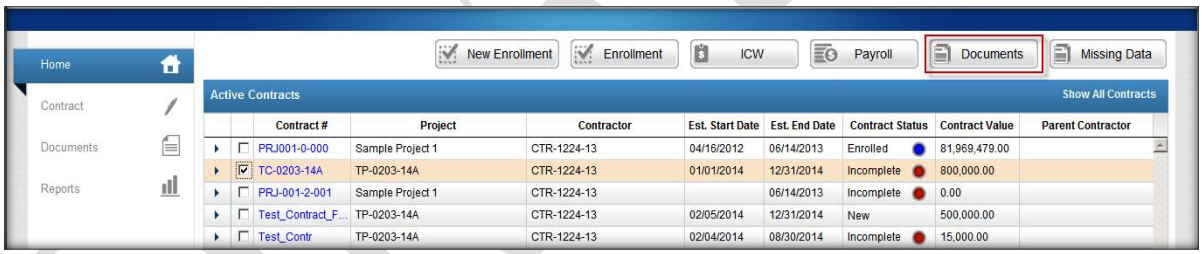
Submit Documentation

- As part of your enrollment, you will be required to submit the following supporting documentation:
    - WC Rating and Dec pages (Upload per instructions below)
    - Monthly Payrolls (Completed on-line and due on the 5th of every month for the preceding month)
    - Notice of Completion (When your work has been completed)

- From the home screen, you can access the document section in one of the two ways mentioned below.
    - Select the record of Contract # from the list on the Home Screen, and then click on Documents button.

      Or
    - Click on Documents sub-menu under Contract from the left menu on the screen.

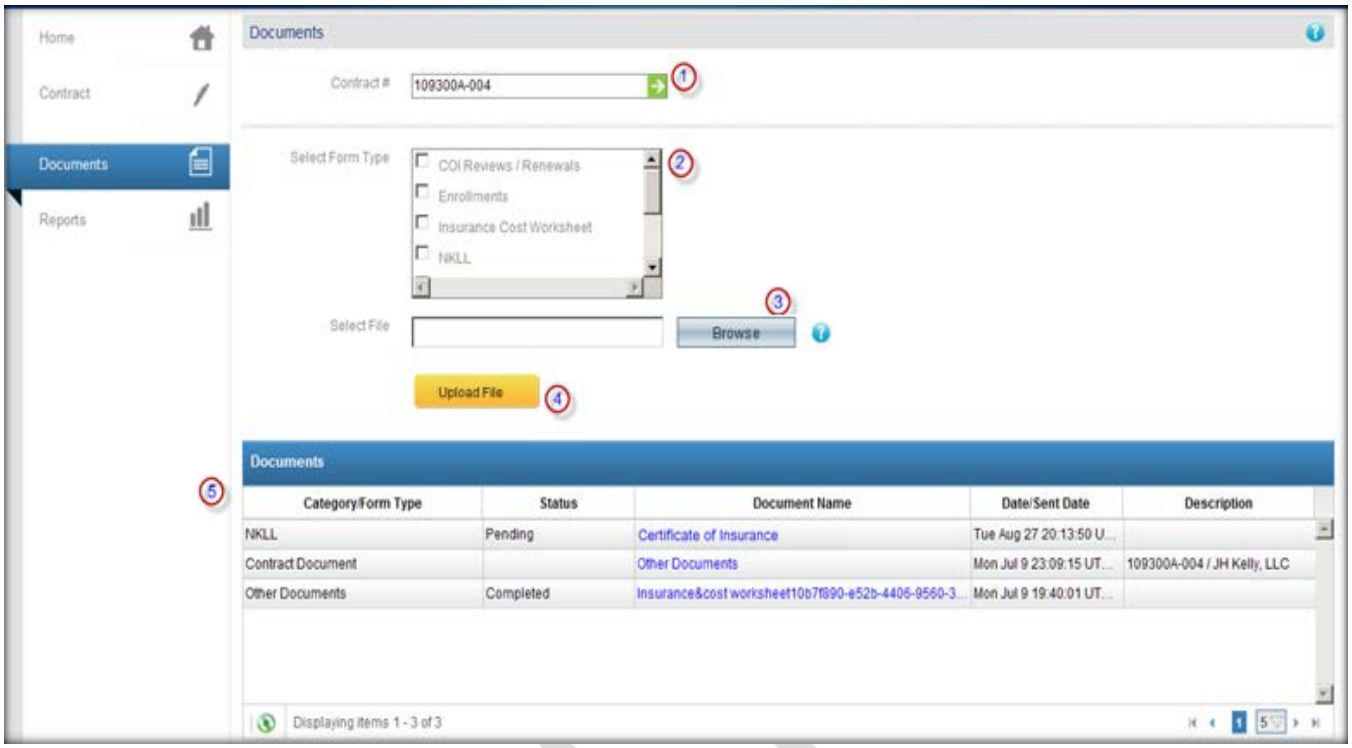
      Or
    - Click on Documents button from the Enrollment page to upload document for a given contract.



- Documents screen will be opened.
    - If you access the documents screen by selecting the contract # from the list on the home page or from the Enrollment page, then the contract # will be pre-filled on the top of the screen.

    - If you access the screen by clicking on the Documents sub-menu from the left menu, then you will need to search the Contract # by providing at least the first three characters of the contract number.

On Documents screen, there are three fields: Contract #, Select Form Type and Select File to upload the document. Refer to the image below.



Screen 1 – Documents Screen

If there are existing document(s) for selected Contract, the system will display those under Documents section.

To add the documents to the selected Contract, please follow below steps.

1. Select Contract # or, if already displayed, go to step #2.
2. Select the Form Type from available options. Note: One can select multiple form types, i.e. Enrollment and NKLL.
3. To locate the file to upload, browse your local drive by clicking on the Browse button. The file must be on your device or computer from which you are currently accessing the portal.
4. Select the file to upload, and click the Upload File button to upload the file.
5. Once the file is successfully uploaded, that document(s) will be listed in Documents Screen.

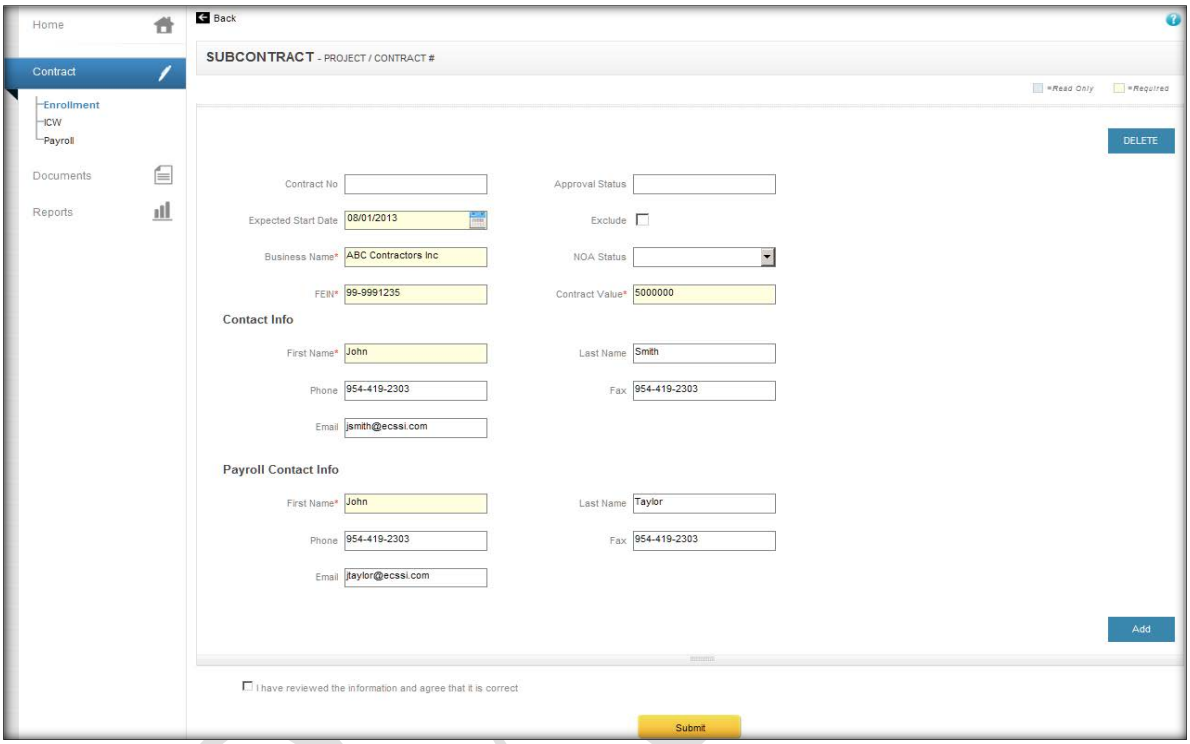
You can return to the Home page by clicking on the Home button.

Note:

1. Only PDF or TIFF documents can be uploaded.
2. Once the document(s) are uploaded, the document(s) will be listed in the Documents section. Click on the link in the Document Name column to confirm it is the right document for that contract.

Add Lower Tier Subcontractors

1. For adding your lower tier Subcontractors for the respective contract, please click on Subcontract button. Please refer to the image below.



2. To add a new Subcontractor, please make sure to enter:
    i. Expected Start Date – Estimated start date of the subcontract
    j. Please enter Business Name, NOA Status (from the available options in the dropdown), FEIN #, Subcontract Value.
    k. Contract # and Approval Status are read only fields.
    l. Please enter following details for Contact Information and Payroll Contact Information for the subcontract.

    First Name, Last Name, Phone #, Fax # and Email Address.
3. To add another subcontractor; please click on the ADD button. A new subcontract block will be added under the existing section.
4. **DELETE** button is available to delete the subcontractor, if needed.
5. Please verify the information and check the checkbox next to the statement "I have reviewed the information and agree that it is correct" before submitting the subcontractor details.

Note:

1. Once subcontract is submitted, system will display the auto generated contract number in the given Contract # field. The Approval Status will also be shown in the Approval Status field.
2. By clicking on Back button on the top-left of the Subcontract screen, the user can go back to the Enrollment screen.

On-line Payroll Reporting Instructions

How to Report Payroll On-Line

- All enrolled Subcontractors **must** submit an On-Site Payroll Report **every month** from the inception of the contract until work is completed. The Payroll report is due on the **5th of every month** for the preceding month's work.
- Actual Payroll details can be submitted online through the portal https://ajg.vuewrapup.com/contractorportal/.

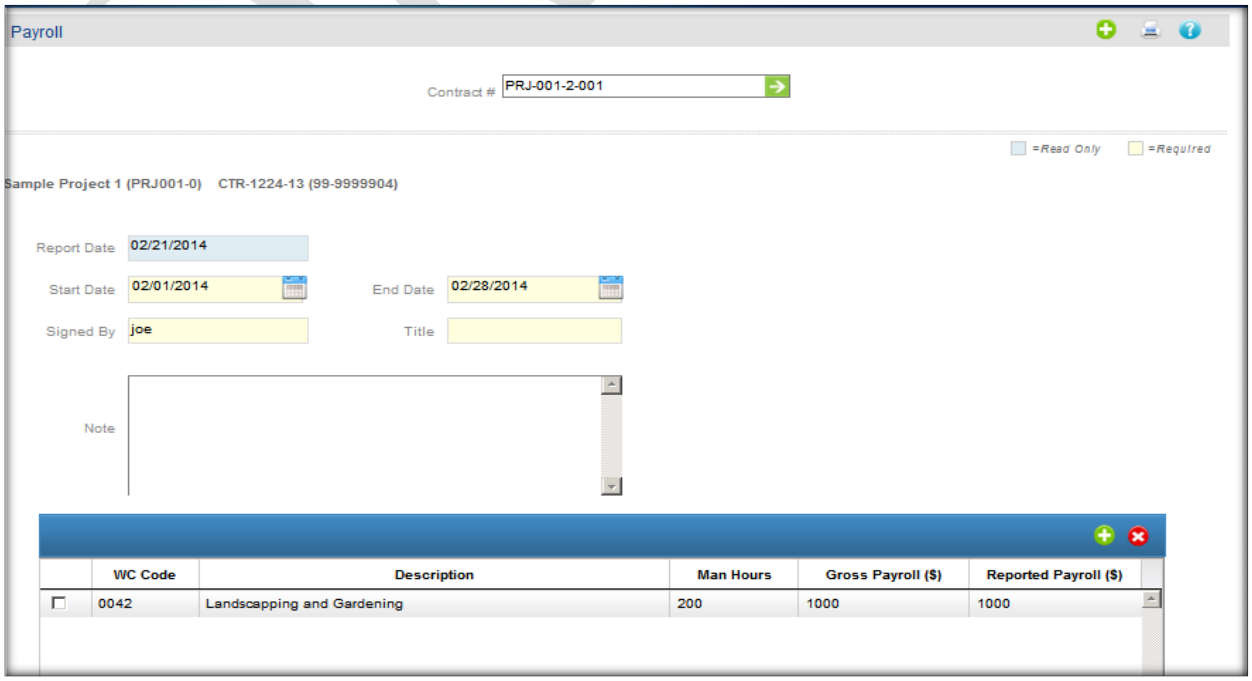
Please follow the steps below to submit the Actual Payroll online.

1. Once logged in to the portal site, the Actual Payroll details can be submitted online by using one of the following two options:
   a. Select the Contract # listed on the Home Screen, then Click on the Payroll button. **NOTE:** If any of your Contract #'s are not listed, please contact your AJG Wrap-up Administrator to check the status of enrollment.

      Or

   b. Click on Payroll sub-menu under Contract from the left menu of the screen.

2. Actual Payroll screen will open. Please see the Actual Payroll Form image on following page.



3. If you selected the Contract # from the Home Screen, the Contract # will be pre-filled on the form. If it is not, you must select the Contract # from the Contract search box above.
4. Report date is the current date, and will be filled by the System.
5. If this is the first payroll report, please enter the Start Date by either manually typing in Date textbox (MM/DD/YYYY), or using the drop down Calendar. Do the same for the End Date. While submitting subsequent payrolls, the System will populate the next calendar day as the Start Date from the previous report. The End Date needs to be entered manually.
6. Signed By textbox will be pre-filled. Title can be manually entered in the Title textbox.
7. On the payroll screen, the WC Code(s) will be filled from the estimated payroll you submitted during enrollment.
8. If you need to add another WC code, click on the green plus button located above the Reported Payroll column.
9. In the WC Code box, enter the WC Code followed by the Description in the next field. In addition, you can delete a selected WC Code by clicking the Delete (x) icon located above the Reported Payroll column. **Note:** You must leave a note in the notes field explaining to the administrator why you are entering payroll for a class code not included on your enrollment.
10. Click the Man Hours field to enter the correct hours. Enter the Gross Payroll that includes unburdened overtime pay.

    Remember: If there are no hours worked for a WC code for that month, enter zero (0).
11. Reported Payroll does not include the premium (excess) portion of any Overtime pay. (i.e. 48 hours. x 24.00$/hr. = $1,152, do not include the premium overtime pay of $12.00 for the 8 hours of overtime). The states of PA, NV, UT, DE and applicable WC monopolistic states require the entire unburdened overtime portion as Reportable Payroll. If you are unsure whether to include the unburdened overtime portion as Reportable Payroll, you can find the information in your CCIP manual, or by calling the AJG Wrap-up Administrator.
12. If a WC Code is entered which was not included in the original Estimated Payroll section on Enrollment Application, a Note explaining the reason for the same must be added before saving the Actual Payroll.
13. If Reported Payroll is less than Man Hours then system will give the message as "Reported payroll should be more than man hours."
14. If Reported Payroll is less than Gross Payroll then system will give the message as "Reported payroll can never be greater than gross payroll."
15. If Payroll Start Date is before Project or Contract Start Date then system will give message as "Payroll cannot be entered before the Project Start date / Contract Start date, which is [DATE]. Please contact AJG Wrap-up Administrator for assistance."
16. After all the required information has been entered, click Submit button. Please note: Once the payroll information has been submitted it cannot be changed. You must contact the AJG Wrap-up Administrator for changes.
17. To print, click Print button on the top right corner of Actual Payroll screen. A PDF file will open displaying the details of the submitted Actual Payroll.

CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY): 4/16/2013

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER	CONTACT NAME:
Your Insurance Agent/Broker Name Address City, State, Zip Code	PHONE (A/C, No, Ext): FAX (A/C, No): E-MAIL ADDRESS: PRODUCER CUSTOMER ID #:

INSURED	INSURER(S) AFFORDING COVERAGE	NAIC #
YOUR COMPANY NAME Address City, State, Zip Code	INSURER A: Your Insurance Company	
	INSURER B: Your Insurance Company	
	INSURER C: Your Insurance Company	
	INSURER D:	
	INSURER E:	
	INSURER F:	

COVERAGES **CERTIFICATE NUMBER:** **REVISION NUMBER:**

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADDL INSR	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS		
A	GENERAL LIABILITY ✓ COMMERCIAL GENERAL LIABILITY CLAIMS-MADE ✓ OCCUR GEN'L AGGREGATE LIMIT APPLIES PER: POLICY PRO-JECT LOC	☐		123456789	05/01/2013	05/01/2014	EACH OCCURRENCE	$	1,000,000
							DAMAGE TO RENTED PREMISES (Ea occurrence)	$	
							MED EXP (Any one person)	$	
							PERSONAL & ADV INJURY	$	1,000,000
							GENERAL AGGREGATE	$	1,000,000
							PRODUCTS - COMP/OP AGG	$	1,000,000
								$	
A	AUTOMOBILE LIABILITY ✓ ANY AUTO ALL OWNED AUTOS SCHEDULED AUTOS HIRED AUTOS NON-OWNED AUTOS	☐		123456789	05/01/2013	05/01/2014	COMBINED SINGLE LIMIT (Ea accident)	$	1,000,000
							BODILY INJURY (Per person)	$	
							BODILY INJURY (Per accident)	$	
							PROPERTY DAMAGE (Per accident)	$	
								$	
								$	
	UMBRELLA LIAB OCCUR EXCESS LIAB CLAIMS-MADE DEDUCTIBLE RETENTION $	☐					EACH OCCURRENCE	$	
							AGGREGATE	$	
								$	
								$	
C	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? Y / N (Mandatory in NH) If yes, describe under DESCRIPTION OF OPERATIONS below	N / A		5556664444	05/01/2013	05/01/2014	✓ WC STATU-TORY LIMITS OTH-ER		
							E.L. EACH ACCIDENT	$	1,000,000
							E.L. DISEASE - EA EMPLOYEE	$	1,000,000
							E.L. DISEASE - POLICY LIMIT	$	1,000,000

SAMPLE DOCUMENT ONLY
Certificate of Insurance must be issued by your primary insurance agent and include the specific wording shown at the bottom of this sample.
E, Mail, Mail or Fax to Arthur J. Gallagher, ROCIP Dept..
EM: Barb_Suttner@ajg.com
Fax: 866-743-3007

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (Attach ACORD 101, Additional Remarks Schedule, if more space is required)

CITY AND COUNTY OF DENVER, DEPARTMENT OF AVIATION, its officers, directors, employees and agents are added as additional insureds, per endorsement evivalent to ISO Form 2010 (Form B). Coverage is primary and non-contributory. Waiver of Subrogation is included for General Liability, Workers' Compensation and Auto Liability per endorsement #_____ attached.

CERTIFICATE HOLDER

City and County of Denver, Department Aviation
DBA Denver International Airport ROCIP
c/o Arthur J. Gallagher Risk Management Services, Inc.
Gallagher Construction Services
12444 Powerscourt Drive
St. Louis, MO 63131

CANCELLATION

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.

AUTHORIZED REPRESENTATIVE

ACORD 25 (2009/09) The ACORD name and logo are registered marks of ACORD

IMPORTANT

If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must be endorsed. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

DISCLAIMER

The Certificate of Insurance on the reverse side of this form does not constitute a contract between the issuing insurer(s), authorized representative or producer, and the certificate holder, nor does it affirmatively or negatively amend, extend or alter the coverage afforded by the policies listed thereon.

ACORD 25 (2001/08)

Instructions for Completing the

First Report of Injury
(Form follows these instructions)

Please read all pages }

Note, the actual fillable PDF is attached as a separate document

This is TBD Telephone Reporting Worksheet and will be used to file the Workers' Compensation Claim electronically by TBD.

This form is "fillable." That means you can type the information onto the form from your computer and print the form. To save the form to your computer's hard drive, save it as a pdf with a unique name, then you can clear the form for the next incident.

Use numbers *only* to fill in the fields for Social Security #, phone numbers and dollar amounts. If a dollar amount contains cents, *do* type the period. To fill in a check box, click inside the box with your mouse. Some check boxes require you to select only one answer; you cannot check both. The "Injury Description", "Name of Witness", and "Name of Doctor" fields have a gray border to indicate how many lines you have to type in. Use the tab key to navigate to the next field.

INSTRUCTIONS

This form contains all items requested on OSHA Form No. 301, "Injuries & Illnesses Incident Report"

General

- All injuries no matter how trivial must be reported to your insurance company.
- All injuries or occupational diseases which result in lost time from work in excess of three shifts or calendar days, or in permanent physical impairment, must be reported to your insurance carrier on this form within ten days after notice or knowledge of the injury or disease. Fatalities must be reported to your insurance carrier immediately.
- Forms should be typed or printed legibly.
- All questions must be answered completely to meet requirements of the Colorado Workers' Compensation Act and to conform to the OSHA requirements for Form No. 301.
- The employer has the right in the first instance, to select the physician who attends the injured employee.

Calculation of Average Weekly Wage

- Determine the weekly wage rate.
- Add the average weekly amount of any overtime wages, tips or commissions.
- Add the average weekly value of any board, rent, housing, or lodging provided by the employer *if the employer will not be paying such benefit during the period of disability*.
- If the employee is covered by group health insurance *and* the employer does not continue the employee's health insurance coverage during the period of disability, add the employee's cost of conversion to a similar or lesser insurance plan and include this cost in the average weekly wage computation.
- Compute the total from the above categories and insert in the *Average weekly wage at time of injury* field.

Injury Date Information

In the case of an occupational disease, use the date of the last injurious exposure.

Notes

Are Wages continued per C.R.S. 8-42-124?[1]
(Subject to application with and approval of the Director of the Colorado Division of Workers' Compensation)

1 Any employer who, by separate agreement, working agreement, contract of hire, or any other procedure, continues to pay a sum in excess of the temporary total disability benefits to an employee temporarily disabled as a result of a work related injury or disease, and has not charged the employee with any earned vacation leave, sick leave, or other similar benefits, shall be reimbursed if insured by an insurance carrier or shall take credit if self-insured, to the extent of all moneys that such employee may be eligible to receive as compensation for temporary partial or temporary total disability subject to the approval of the Director of the Colorado Division of Workers' Compensation.

Injury Description (Tell us the part of the body that was affected. Tell us the nature of the injury/illness[2]; What was the employee doing just before the accident occurred?[3]; What happened?[4]; What object or substance directly harmed the employee?[5])

2 Be more specific than "hurt", "pain", or "sore." Examples: "strained back"; "chemical burn, hand"; "carpal tunnel syndrome."
3 Describe the activity, as well as the tools, equipment or material the employee was using. Be specific. Examples: "climbing a ladder while carrying roofing materials"; "spraying chlorine from hand sprayer"; or "daily computer key-entry."
4 Tell us how the injury occurred. Examples: "When ladder slipped on wet floor, worker fell 20 feet"; "Worker was sprayed with chlorine when gasket broke during replacement"; "Worker developed soreness in wrist over time."
5 Examples: "concrete floor"; "chlorine"; "radial arm saw." If this question does not apply to the incident, leave it blank

Notices

You are hereby notified that if a child support obligation is owed, compensation benefits may be attached and payment of the child support obligation may be withheld and forwarded to the obligee pursuant to sections 8-42-124 and 26-13-122(4), C.R.S. YOU ARE FURTHER NOTIFIED that you must provide written notice of any award for social security, pension, disability or other source of income that might reduce your compensation benefits. This notice must be sent to the insurance carrier or self-insured employer within 20 days after learning of the payment or award. Failure to report may result in suspension of your benefits pursuant to section 8-42-113.5, C.R.S.

C.R.S. Section 10-1-128(6) (a) states: "It is unlawful to knowingly provide false, incomplete, or misleading facts or information to an insurance company for the purposes of defrauding or attempting to defraud the company. Penalties may include imprisonment, fines, denial of insurance, and civil damages. Any insurance company or agent of an insurance company who knowingly provides false, incomplete, or misleading facts or information to a policyholder or claimant for the purpose of defrauding or attempting to defraud the policyholder or claimant with regard to a settlement or award payable from insurance proceeds shall be reported to the Colorado division of insurance within the department of regulatory agencies."

WC 1 Rev 01/06

WC 8062r (1-06)

Note, the actual fillable PDF is attached as a separate document

WORKERS' COMPENSATION TELEPHONE REPORTING WORKSHEET

THINGS TO REMEMBER WHEN COMPLETING THE INFORMATION BELOW:
Call the Telephone Reporting Center to quickly and easily report all Workers' Compensation injuries. We will be asking you the following questions, so please have the information handy. We will produce and submit the necessary state forms.

DO NOT DELAY IN CALLING IF YOU DO NOT HAVE ANSWERS TO ALL THE QUESTIONS.

ACCOUNT / ACCIDENT INFORMATION

CALLER'S PHONE NUMBER / EXTENSION	CALLER'S TITLE	CALLER'S NAME	REPORTING STATE
( )			CO

SUBCONTRACTOR/SUBSIDIARY NAME	SUBCONTRACTOR'S ADDRESS (STREET, CITY, STATE & ZIP)	SUBCONTRACTOR'S MAILING ADDRESS (STREET, CITY, STATE & ZIP) ☐ SAME

DID THE ACCIDENT OCCUR AT THE LOCATION ADDRESS?
☐ YES ☐ NO IF NO, ADDRESS WHERE ACCIDENT OCCURRED

PARENT COMPANY / INSURED'S NAME
City and County of Denver, Department of Aviation, DEN ROCIP II [Account # 0000047842]

LOCATION CODE	POLICY SYMBOL AND NUMBER	NATURE OF BUSINESS

DATE OF INJURY	TIME OF INJURY

ACCIDENT DESCRIPTION

EMPLOYEE INFORMATION

INJURED EMPLOYEE'S SOCIAL SECURITY NUMBER:	EMPLOYEE'S NAME (FIRST, MI, LAST)	GENDER ☐ MALE ☐ FEMALE

DATE OF BIRTH	EMPLOYEE'S MAILING ADDRESS

EMPLOYEE'S HOME PHONE NUMBER	EMPLOYEE'S HOME ADDRESS (IF DIFFERENT FROM MAILING)
( )	

EMPLOYEE JOB INFORMATION

EMPLOYMENT STATUS CODE ☐ FULL-TIME ☐ PART-TIME ☐ OTHER_____	INJURED WORKER TYPE	REGULAR OCCUPATION

OCCUPATION WHEN INJURED

EMPLOYEE'S WORK SCHEDULE
REGULAR WORK HOURS HOURS/DAY DAYS/WEEK

EMPLOYEE'S WAGE INFORMATION:
$_____/ HOUR OR $_____/ ANNUAL OR $_____/ WEEKLY OVERTIME: $_____ ADDITIONAL BENEFITS: $_____

DATE OF HIRE OR LENGTH OF EMPLOYMENT

SUPERVISOR'S NAME:	SUPERVISOR'S PHONE NUMBER: ( )	BEST HOURS TO CONTACT

ACCIDENT INFORMATION

DATE CLAIM REPORTED TO EMPLOYER?	DID EMPLOYEE LOSE ANY TIME FROM WORK? ☐ YES ☐ NO	IS THE EMPLOYEE BACK AT WORK? ☐ YES ☐ NO IF YES, DATE RETURNED TO WORK?

RETURN TO WORK STATUS ☐ LIGHT ☐ MODIFIED ☐ REGULAR	DATE EMPLOYEE LAST WORKED	WAS INJURY FATAL? IF YES, DATE OF DEATH ☐ YES ☐ NO

CAUSE OF ACCIDENT (E.G., SLIP/FALL, LIFTING, CHEMICAL)

EQUIPMENT, MATERIAL OR SUBSTANCE INVOLVED

DO YOU QUESTION THE VALIDITY OF THE CLAIM?
☐ YES ☐ NO

WITNESS INFORMATION/OTHERS INVOLVED
NAME (FIRST, MI, LAST) ADDRESS PHONE NUMBER

CONTINUED ON REVERSE SIDE

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INJURY INFORMATION

PART OF BODY INJURED (E.G., HEAD, NECK, ARM, LEG)

NATURE OF INJURY (E.G., FRACTURE, SPRAIN, LACERATION

PRIOR INJURY OR PRE-EXISTING CONDITION(S) (IF YES, DESCRIBE)

☐ YES ☐ NO

TREATMENT ("X" ALL THAT APPLY

☐ FIRST AID —	TREATMENT AND DATE OF 1ST TREATMENT
☐ HOSPITAL/ CLINIC —	NAME, ADDRESS, PHONE NUMBER, PHYSICIAN NAME, TREATMENT, DATE OF 1ST TREATMENT, LENGTH OF STAY, AMBULANCE USED? WAS EMPLOYEE TREATED IN AN EMERGENCY ROOM? ☐ YES ☐ NO WAS EMPLOYEE HOSPITALIZED OVERNIGHT AS AN IN-PATIENT`? ☐ YES ☐ NO
☐ PHYSICIAN —	

SEE WORKERS' COMPENSATION - FIRST REPORT OF INJURY - STATE SPECIFIC QUESTIONS FOR YOUR INDIVIDUAL STATE.

CUSTOMER SPECIFIC INFORMATION

ADDITIONAL COMMENTS & INFORMATION

C-23437 Rev. 9/02 (Back)

City and County of Denver
CCD ROCIP
GENERAL LIABILITY LOSS REPORT

DESIGNATED PROJECT:	[Abstract]

Contractors Email to Devron.McMillin@denvergov.org and to Kendall_trump@ajg.com within 24 hours of incident. Once complete, DIA will submit to Arthur J. Gallagher. Contact AJG by telephone at **(303) 773-9999** about any case involving bodily injury / fatality, extensive property damage, or lawsuit.

POLICY HOLDER / COMPANY NAME

Name				Phone Number
DENVER INTERNATIONAL AIRPORT ROCIP III				
Address	**Street**	**City**	**State**	**Zip Code**
	8500 Pena Boulevard	Denver	CO	80249

TIME AND PLACE OF ACCIDENT

Date of Accident	Hour A.M. P.M.	Location of Accident
Date Notified of Loss		

DESCRIPTION OF ACCIDENT

Full description and cause of accident *(Attach photos, if available)*

Was accident caused by employee of subcontractor? ☐ Yes ☐ No — If "Yes," give employee's name

Name of subcontractor | Address | Street | City | State & Zip Code

Who owns premises where accident occurred?

Does your lease or contract contain any provision regarding injuries?

WITNESSES (VERY IMPORTANT)

Names | Addresses | Street | City | State & Zip Code

INJURED PERSON AND INJURIES

Name of person injured | Age | ☐ Married | ☐ Single

Address | Street | City | State | Phone Number

Nature and extent of injuries

Name of doctor or hospital | Address | Street | City | State & Zip Code

By whom is injured person employed?

Did injured person lose time from work as a result of this injury? ☐ Yes ☐ No

Has injured returned to work? ☐ Yes ☐ No

DAMAGE TO PROPERTY OF OTHERS

Names | Addresses | Street | City | State & Zip Code

Kind of property | Phone Number

Where may property be seen? | Estimated cost of repairs

Do you think a claim will be made against you? ☐ Yes ☐ No | By whom?

Date of this report

Signed

Michael B. Hancock
Mayor

PROCEDURE FOR FILING A NOTICE OF CLAIM
AGAINST THE CITY AND COUNTY OF DENVER

(For any party who may want to make a claim for any accident or incident involving the City and County of Denver)

1. Write and file a Notice of Claim (letter) that complies with the provisions of the Colorado Governmental Immunity Act notice requirements found in §24-10-109, 7B (2003), as amended and may be further amended by the legislature.

2. Mail or deliver your Notice of Claim to:

   Mayor Michael Hancock
   1437 Bannock Street, Room 350
   Denver, CO 80202

3. The Mayor's Office will forward your Notice of Claim to the Denver City Attorney's Office. You will receive a letter, which Will provide Denver's claim number and the investigator's name and phone number.

4. If you have any questions about your claim contact the Denver International Airport Risk Management Department at 303.342-2151.

24-10-109. Notice required - contents - to whom given - limitations. Statute text

(1) Any person claiming to have suffered an injury by a public entity or by an employee thereof while in the course of such employment, whether or not by a willful and wanton act or omission, shall file a written notice as provided in this section within one hundred eighty days after the date of the discovery of the injury, regardless of whether the person then knew all of the elements of a claim or of a cause of action for such injury. Compliance with the provisions of this section shall be a jurisdictional prerequisite to any action brought under the provisions of this article, and failure of compliance shall forever bar any such action.

(2) The notice shall contain the following:

(a) The name and address of the claimant and the name and address of his attorney, if any;

(b) A concise statement of the factual basis of the claim, including the date, time, place, and circumstances of the act, omission, or event complained of;

(c) The name and address of any public employee involved, if known;

(d) A concise statement of the nature and the extent of the injury claimed to have been suffered;

(e) A statement of the amount of monetary damages that is being requested.

(3) If the claim is against the state or an employee thereof, the notice shall be filed with the attorney general. If the claim is against any other public entity or an employee thereof, the notice shall be filed with the governing body of the public entity or the attorney representing the public entity. Such notice shall be effective upon mailing by registered mail or upon personal service.

(4) When the claim is one for death by wrongful act or omission, the notice may be presented by the personal representative, surviving spouse, or next of kin of the deceased.

(5) Any action brought pursuant to this article shall be commenced within the time period provided for that type of action in articles 80 and 81 of title 13, C.R.S., relating to limitation of actions, or it shall be forever barred; except that, if compliance with the provisions of subsection (6) of this section would otherwise result in the barring of an action, such time period shall be extended by the time period required for compliance with the provisions of subsection (6) of this section.

(6) No action brought pursuant to this article shall be commenced until after the claimant who has filed timely notice pursuant to subsection (1) of this section has received notice from the public entity that the public entity has denied the claim or until after ninety days has passed following the filing of the notice of claim required by this section, whichever occurs first.

Source: L. 71: p. 1207, § 1. **C.R.S. 1963:** § 130-11-9. **L. 79:** (1) amended, p. 862, § 2, effective July 1. **L. 86:** (1),(2)(b), (3), and (5) amended and (6) added, p. 877, § 9, effective July 1. **L. 92:** (1) amended, p. 1117, § 4, effective July 1.

BUILDERS RISK CLAIMS

DESIGNATED PROJECT:	Enter Project Here

1. Take immediate steps to protect property from further damage, securing temporary board-up service if necessary. Keep records of all expenses related to your loss. **Secure all damaged equipment or parts for cause of loss and subrogation investigation by the Insurance Carrier.**
2. List all items damaged or stolen. If original purchase invoices are available, accumulate for the claim representative.
3. Call police department, if appropriate. Please note that your policy requires that all theft losses MUST BE reported to the police.
4. Save any damaged property for examination by the insurance company.
5. If a third party is responsible for the damage, obtain their name, address and telephone number or, if applicable, the make of vehicle and license plate number.
6. Complete the attached Incident Report and email to Kendall Trump at A. J. Gallagher at Kendall_trump@ajg.com or fax to 303.889.2571 within 24 hours.

CCD ROCIP
BUILDERS RISK LOSS REPORT

Email to Arthur J. Gallagher: Kendall_Trump@ajg.com or fax to (303) 889-2571 within 24 hours of incident.

Company Name: **City and County of Denver, ROCIP**				
Mailing Address Street	City		State	Zip Code
8500 Pena Boulevard	*Denver*		*CO*	*80249*
Date of Loss or Accident Month	Day	Year	Time	A.M. P.M.
Location where loss or accident occurred Street	City		State	Zip Code
Cause of loss (i.e., fire, wind, theft, etc.)				
Describe how loss or accident occurred				
General description of property *(Attach photos or inventory if appropriate)*				
If caused by burglary, theft or vandalism, was loss reported to police?		☐ Yes	☐ No	
If yes, police address and case number				
Estimate of entire loss $				
Estimated salvage value of damaged articles $				
Which fire department(s) attended?				
Name of person reporting claim	Phone number & Email			

Exhibit I –Task Order/Work Order Notice to Proceed

DENVER
THE MILE HIGH CITY

Mayor's Office of the
National Western Center
201 W. Colfax Avenue,
Department 205
Denver, CO 80202
720.865.2839

DATE

Attn: {Contractor Point of Contact}

RE: Master On-Call Contract No.:
Project Name:
Encumbrance Number:
Work Order No.:

Dear _____,

In accordance with General Contract Coordination 302 in Title 3 of the Standard specifications for Construction, General Contract Conditions, 2011 Edition, you are hereby authorized and directed to proceed on (MM/DD/YY) with the work described in the above referenced Work Order No. in accordance with the terms and conditions of your Master On-Call Contract with the City and County of Denver.

The established Contract Time for this Work Order is _____ consecutive calendar days, therefore, all work must be completed on or before _____. The not to maximum amount for this _____ order is $_____, including all fees and reimbursable expenses

If you have not already done do, please submit your construction schedule, in accordance with General Contract Conditions 306, to the Project Manager within 10 days. The Project Manager for this {Task, Work} Order is {Name and Contact Information}

Regards,

Executive Director, NWCO

Exhibit J – Task/Work Order Change Form

DENVER
THE MILE HIGH CITY

Horizontal Integrated Construction
{WORK, TASK} ORDER CHANGE

Contractor:	#N/A		
Work,Task Order Name:	1/0/1900	Vendor ID:	0000000000
	0	Master Contract No.:	0
Project Manager:		Work,Task Order No.:	0
Encumbrance No.:			

It is hereby mutually agreed that when this WORK ORDER CHANGE has been signed by the contracting parties, the following described changes shall be executed by the contractor without changing the terms of the Contract except as herein stipulated and agreed.

Insert change reason here. This statement should be a simple one sentence explanation of the change.
Do not write "See attached Proposal"

EXAMPLE

The additional sum, as indicated below, constitutes full and complete consideration, payment and satisfaction to the Contractor for the above described changes to the Contract, and the Contractor hereby agrees to make no further claims, demands, or requests of any kind whatsoever for further moneys, extensions of time or other consideration for the above described changes to the Contract.

THE CONTRACTOR AGREES to furnish all material and labor and perform all work required to complete the above described work in accordance with requirements for similar work covered by the Contract, except as otherwise stipulated herein, for the following considerations:

The Sum of: ☐ Add or ☐ Subtract
Adjust the Completion Date by:
New Completion Date:

Accepted by Contractor: **Title:** **Date:**

0

WORK ORDER SUMMARY

Original Work Order Amount:	
Sum of Previous Work Order Changes:	
This Work Order Change:	
Revised Work Order Amount:	$0.00

MASTER CONTRACT SUMMARY

Sum of Contract work orders and changes:	
Maximum Contract Amount:	#N/A
Remaining Contract capacity:	#N/A

Approved -Executive Director	Date
Approved -Department Director	Date
Approved -Portfolio Manager	Date
Approved -User Agency (If Applicable)	Date
Approved -Project Supervisor (If Applicable)	Date
Approved -Project Manager	Date

NOTE: No person shall authorize or perform any of the above work until the work order has all signatures and has been distributed. Distribution: Prevailing Wage: AUDPWPayRequest@denvergov.org; DSBO@ci.denver.co.us; Project manager email, Using Agency and pw.contracts@denvergov.org (for pre-encumbrance).

Exhibit K – Task/Work Order Substantial Completion Notice Form

DENVER
THE MILE HIGH CITY

CERTIFICATE OF SUBSTANTIAL COMPLETION
HORIZONTAL INTEGRATED CONTRACTOR WORK/TASK ORDER

Insert Date Here

0
Attn:
#N/A
#N/A

Re: Master On-Call Contract No.: 0
Project Name: 1/0/1900
Encumbrance Number: 0
Work Order No.: 0

Dear

Your Notification of Substantial Completion for the above referenced project was received on **MM/DD/YY**. The project was inspected by the Project Manager and **include other appropriate person** on **MM/DD/YY** and was determined to be substantially complete in accordance with General Contract Condition 1903 of the Standard Specifications for Construction, General Contract Conditions, 2011 Edition.

Per General Contract Condition 1903, attached is the punch list of items to be repaired or replaced and assignment of responsibilities for security, maintenance, property insurance premiums, and damage to the work until Final Acceptance is issued by the City.

We are issuing this Certificate and establishing the Date of Substantial Completion as of **MM/DD/YY** and the time period to complete the punch list work as **written number** Calendar Days from the date of this Certificate.

_____
Contrator

_____
Executive Director NWCO

Project Manager _____ Supervisor _____

Exhibit L – Task/Work Order Final Acceptance Notice Form

DENVER
THE MILE HIGH CITY

CERTIFICATE OF FINAL ACCEPTANCE
HORIZONTAL INTEGRATED CONTRACTOR WORK/TASK ORDER

Insert Date Here

#N/A
Attn:
#N/A
#N/A

Re: Master On-Call Contract No.: 0
Project Name: 1/0/1900
Encumbrance Number: 0
Work Order No.: 0

Dear TEST

Your notification for final inspection of the above referenced project was received on **MM/DD/YY**. The project was inspected by the Project Manager and **include other appropriate persons** on **MM/DD/YY** and the work was determined to be completed in accordance with the Contract documents. Therefore, in accordance with General Contract Condition 2002 of the Standard Specifications for Construction, General Contract Conditions, 2011 Edition, this Certificate of Final Acceptance is being issued, effective as of **MM/DD/YY**.

Items A through J, listed in section 2003 of the Standard Specifications for Construction, General Contract Conditions, and 2011 Edition have now been furnished. All change orders have been executed at this time.

Per General Contract Condition 1801, the warranty/guarantee periods start, effective as of **MM/DD/YY**.
If required, you must satisfactorily complete the one-year maintenance period before final settlement can be made.

The project was completed within the contract time therefore no liquidated damages are due.

_____
Contractor

_____
Executive Director, The Mayor's Office of the National Western Center

Project Manager _____ Supervisor _____

The Mayor's Office of the National Western Center
201 W. Colfax Dept. 205, Denver, CO 80205
www.nationalwesterncenter.com

Exhibit M –Work Order Final Receipt (Certificate of Release)

Denver Public Works
Engineering Division
Capital Projects Management – Dept. 506
Right-of-Way Services – Dept 507
Traffic Engineering Services – Dept 508
Policy and Planning – Dept. 509
201 West Colfax Ave, Dept 614
Denver, CO 80202
www.work4denver.com

(SAMPLE)

Date

Name
Company
Street
City/State/Zip

RE: Certificate of Contract Release for
«CONTRACT_NO», «PROJECT_NAME»

Received this date of the City and County of Denver, as full and final payment of the cost of the improvements provided for in the foregoing contract Work Order,_____ dollars and cents ($), in cash, being the remainder of the full amount accruing to the undersigned by virtue of said contract; said cash also covering and including full payment for the cost of all extra work and material furnished by the undersigned in the construction of said improvements, and all incidentals thereto, and the undersigned hereby releases said City and County of Denver from any and all claims or demands whatsoever, regardless of how denominated, growing out of said contract.

And these presents are to certify that all persons performing work upon or furnishing materials for said improvements under the foregoing contract have been paid in full and this payment to be made is the last or final payment.

_____

Contractor's Signature Date Signed

If there are any questions, please contact me by telephone at (720) 913-XXXX. Please return this document via facsimile at (720) 913-1805 and mail to original to the above address.

Exhibit N – Final/Partial Lien Release Form

FINAL/PARTIAL RELEASE AND CERTIFICATE OF PAYMENT (SUBCONTRACTOR/SUPPLIER)

_____
(PROJECT NO. and NAME)

_____
(NAME OF CONTRACTOR)

_____
(NAME OF SUBCONTRACTOR/SUPPLIER)

Check Applicable Box:

[ ] MBE [ ] WBE

Date: _____, 20___.

Subcontract #:_____.

Subcontract Value: $_____.
Last Progress Payment: $_____.
Date: _____.
Total Paid to Date: $_____.
Date of Last Work: _____.

The Undersigned hereby certifies that all costs, charges or expenses incurred by the undersigned or on behalf of the undersigned for any work, labor or services performed and for any materials, supplies or equipment provided on the above referenced Project or used in connection with the above referenced Subcontract (the "Work Effort") have been duly paid in full.

The Undersigned further certifies that each of the undersigned's subcontractors and suppliers that incurred or caused to be incurred, on their behalf, costs, charges or expenses in connection with the undersigned's Work Effort on the above referenced Project have been duly paid in full.

In consideration of $_____ representing the Last Progress Payment referenced above and in further consideration of the Total Paid to Date, also referenced above, and other good and valuable consideration received and accepted by the undersigned this _____ day of _____, 20__, the Undersigned hereby releases and discharges the City and County of Denver (the "City"), the above referenced City Project, the City's premises and property and the above referenced Contractor from all claims, liens, rights, liabilities, demands and obligations, whether known or unknown, of every nature arising out of or in connection with the performance of the work effort.

As additional consideration for the payments referenced above, the undersigned agrees to defend, indemnify and save and hold harmless the City, its officers, employees, agents and assigns and the above-referenced Contractor from and against all costs, losses, damages, causes of action, judgments under the subcontract and expenses arising out of or in connection with any claim or claims against the City or the Contractor which arise out of the Undersigned's performance of the Work Effort and which may be asserted by the Undersigned or any of its suppliers or subcontractors of any tier or any of their representatives, officers, agents, or employees.

It is acknowledged that this release is for the benefit of and may be relied upon by the City and the referenced Contractor.

The foregoing shall not relieve the undersigned of any obligation under the provisions of the Undersigned's subcontract, as the subcontract may have been amended, which by their nature survive completion of the Undersigned's work effort including, without limitation, warranties, guarantees, insurance requirements and indemnities.

STATE OF COLORADO) ss.
CITY OF _____)

_____
(Name of Subcontractor)

Signed and sworn before me this
day of _____, 20___. By:_____

_____.
Notary Public/Commissioner of Oaths
My Commission Expires

Title: _____

Exhibit O – Contractor's Certificate of Payment Form

DENVER
OFFICE OF ECONOMIC DEVELOPMENT

City and County of Denver

Division of Small Business Opportunity

Contractor's/Consultant's Certification of Payment (CCP)

Office of Economic Development
Compliance Unit
201 W. Colfax Ave., Dept. 907
Denver, CO 80202
Phone: 720.913.1999
Fax: 720.913.1803

Prime Contractor or Consultant:	Phone:	Project Manager:
Pay Application #:	Pay Period:	Amount Requested: $
Project #:	Project Name:	
Current Completion Date:	Percent Complete:	Prepared By:
(I) - Original Contract Amount: $	(II) - Current Contract Amount: $	

		A	B	C	D	E	F	G	H
Prime/Subcontractor/Supplier Name	M/W/S/E DBE/ NON	Original Contract Amount	% Bid (A/I)	Current Contract Amount including Amendments	% Revised (C/II)	Requested Amount of this Pay Application	Amount Paid on the Previous Pay Application # ___	Net Paid To Date	Paid % Achieved (G/II)
Totals									

The undersigned certifies that the information contained in this document is true, accurate and that the payments shown have been made to all subcontractors and suppliers used on this project and listed herein. Please use an additional form, if more space is necessary.

Prepared By (Signature):	Date:

EXHIBIT P

COMPLIANCE PLAN

CITY AND COUNTY OF DENVER
DIVISION OF SMALL BUSINESS OPPORTUNITY

CONTRUCTION CONTRACT COMPLIANCE PLAN FOR M/WBE PARTICIPATION

Hensel Phelps Construction Co.
National Western Center – Horizontal Integrated Construction Services
[CONTRACT NO. 201841662

CITY AND COUNTY OF DENVER
DIVISION OF SMALL BUSINESS OPPORTUNITY

CONSTRUCTION CONTRACT COMPLIANCE PLAN FOR M/WBE PARTICIPATION

Hensel Phelps Construction Co.
National Western Center – Horizontal Integrated Construction Services
[CONTRACT NO. 201841662

SECTION 1: INTRODUCTION.

A. Hensel Phelps Construction Co. (the "Contractor") submits this Compliance Plan to the Director of the Division of Small Business Opportunity ("Director") in accordance with §§ 28-51 to 28-83, D.R.M.C., and the Rules and Regulations for the Interpretation, Administration and Enforcement of Division 1, Article III of Chapter 28, D.R.M.C.; Division 3, Article III of Chapter 28; and Article VII of Chapter 28, D.R.M.C. ("Rules"). During the course of the Contract, the M/WBE Code and Rules may be amended or revised. City and DSBO shall provide prompt and reasonable notice of amendments and revisions, if any. Contractor shall remain obligated to meeting the requirements of the Code, Rules, and this Compliance Plan.

B. Sections 28-51 to 28-83, D.R.M.C. (the "M/WBE Code") shall apply to the work and projects performed under the Horizontal Integrated Construction Services Contract ("HIC" or "Contract"). In accordance with § 28-59, the Director, with the assistance of a goals committee, shall review the Work Orders issued under the Contract and shall establish, on a "per-Work-Order-basis", goals for the portions of the work detailed in individual Work Orders. This Compliance Plan is issued for the specific Work Order. The M/WBE participation goal for this Work Order under the Contract is TBD **– will be established based on the scope of each Type 2 and Type 3 work order**.

C. The Contractor shall meet all compliance requirements under the M/WBE Code, including but not limited to §§ 28-61 through 28-65, and §§ 28-66 through 28-77, in its performance of the Contract. The Contractor will continually pursue a level of M/WBE participation that equals or exceeds **TBD – will be established based on the scope of each Type 2 and Type 3 work order** of the total price established under the individual Work Order.

D. Because of the delivery method used for this Project, the work under the Contract was not ready for subcontracting at the time the Contractor was awarded the Contract. Therefore, this Compliance Plan provides for M/WBE solicitation and participation consistent with § 28-60 of the M/WBE Code. An M/WBE participation goal shall be established for each Work Order issued under this Contract. The process by which the Contractor will solicit, obtain, count and maintain participation by MBE and WBE firms for this Project under this Compliance Plan shall be consistent with the requirements of §§ 28-59, 28-60 and

28-63 of the M/WBE Code, and Rule VII(C). In accordance with § 29-59, the Director retains discretion, in the best interest of the City, to waive the application of a goal for a given Work Order.

E. This Compliance Plan describes the processes and procedures by which the Contractor shall address and achieve the project goal on the individual Work Orders. Contractor represents that the Project work detailed in the applicable Work Order is sufficiently defined to allow the Contractor to procure subcontractors and suppliers and to utilize MBE/WBEs for the Project work for this Work Order.

F. This Compliance Plan has been developed in conjunction with the Contract for Integrated Construction services to be delivered through the Work Orders issued under the Contract, which may provide for preconstruction services and bid-build procurement upon design completion. The Contractor will deliver the construction work under separate and individual Work Orders, as detailed in the Contract and this Compliance Plan.

SECTION 2: KEY PERSONNEL.

Brian Penner, (512) 844-8692, bpenner@henselphelps.com has been assigned as the Contract Manager for this Contract. The Contract Manager is responsible for the overall management of the Contractor's performance of the Project.

Tom Dooley, (303) 717-5486, tdooley@henselphelps.com is the Preconstruction Manager, who reports to the Contract Manager and is responsible for compliance with this Compliance Plan, outreach and coordination activities, and maintaining appropriate records to ensure that goals are met.

Julia Highlen, (541) 231-5137, jhighlen@henselphelps.com is the Documentation Manager, who will administer subcontracts and ensure that all documentation required by DSBO is prepared and maintained. Ms. Highlen will coordinate the collection of DSBO documentation and monthly payroll reports from all subcontractors and suppliers, including but not limited to M/WBEs.

SECTION 3: DEVELOPING WORK ORDERS FOR SUBMISSION TO GOAL SETTING PROCESS AND BIDDING.

A. As of execution of the Contract, the specific scopes of work for Type 2 and Type 3 Work Orders have not been finalized. As a result, the work under the Contract shall be developed by and in conjunction with the City, the City's design consultant, and the Contractor. The City and the City's design consultant shall develop the design and create proposal request packages ("Work Orders"), which will include, among other items, that portion of the design and proposed work intended to be submitted to, and advertised for bid by, the Contractor.

B. The anticipated work under the Contract shall be categorized as follows:

Type 1 Task Orders: Predevelopment and preconstruction work; to be self-performed by the Contractor and not subject a goal.

Type 2 Work Orders: Temporary Site Work Orders as defined by Article 3 of the Contract. Type 2 Work Orders shall be submitted to DSBO and the Director for assignment of participation goals.

Type 3 Work Orders: Standard construction as defined by Article 4 of the Contract. Type 3 Work Orders shall be submitted to and reviewed by DSBO and the Director for assignment of participation goals.

C. Prior to submission of the Work Order to the Contractor, the Type 2 and Type 3 Work Orders shall be submitted by the City to the Director and DSBO for establishment of the M/WBE participation goal. The Work Order, with its established goal, shall then be submitted to the Contractor. The Work Order shall then be advertised for bidding by the Contractor, including selection of the M/WBE.

D. Contractor will provide the Goals Schedule Chart to DSBO as Work Orders are defined and specific Work Order goals are set prior to advertisement of the Work Order. The goals schedule will be updated and provided to DSBO as each package is awarded. Below is a sample goals schedule that reflects anticipated high level Work Order category to be further refined on a Work Order by Work Order Basis.

GOALS SCHEDULE CHART [Provided prior to Work Order bid]

		Total Contract Scope Value		**Estimated Potential MWBE Participation**	
Workscope	**Tier**	**Total Contract $**	**Total Contract %**	**$ of Listed Scope**	**% of Constr Services**
Work Order Type 2 – Temp Site	1	TBD	TBD	TBD	TBD
Work Order Type 3 – Final Construction	1	TBD	TBD	TBD	TBD
Total – Potential MWBE Construction Services		TBD	TBD	TBD	TBD

GOALS SCHEDULE CHART [Provided after Work Order is awarded]				
AVAILABLE SUB-TRADE	**APPROXIMATE DOLLAR AMOUNT**	**PERCENT-AGE OF TOTAL PROJECT**	**ASSIGNED MWBE GOAL PER SECTION**	**ANTICIPATED RESULTING MWBE PARTICIPATION**
	TBD	TBD	TBD	TBD
	TBD	TBD	TBD	TBD
	TBD	TBD	TBD	TBD
	TBD	TBD	TBD	TBD
	TBD	TBD	TBD	TBD
	TBD	TBD	TBD	TBD
	TBD	TBD	TBD	TBD
	TBD	TBD	TBD	TBD
	TBD	TBD	TBD	TBD
	TBD	TBD	TBD	TBD
	TBD	TBD	TBD	TBD
Other work directed by NWC	TBD	TBD	TBD	TBD
TOTAL	**TBD**	**TBD**	**TBD**	**TBD**

E. The Contractor has the following preliminary schedule for issuance of each Work Order:

Type 2 Work Orders – TBD based on final project phasing plan
Type 3 Work Orders – TBD based on final project phasing plan

F. In order to maximize M/WBE participation, the Contractor shall subcontract the following types of work: Temporary signage, temporary barricades and traffic control, field office management, trash removal, office supply procurement.

SECTION 4: PROCEDURE FOR ADVERTISING; COMMUNITY OUTREACH EFFORTS.

A. When the Work Order is sufficient for advertising and subcontracting, the Contractor will formally advertise the Work Order in accordance with the M/WBE Code, the Rules, and this Compliance Plan. Upon receipt of a Work Order from the City, Hensel Phelps will prepare Instructions To Bidders ("ITB") which will include a description of the work, a current or proposed schedule, bonding and insurance requirements, the contract documents, prequalification requirements (as previously shared with the industry in outreach events, described below), pre-bid meeting date/time and other supporting information. The Work Order, bid package and ITB will then be advertised by published

notices in local publications and websites, identifying the subcontracting opportunities and specifically soliciting City-certified M/WBE participation. The Contractor will also provide notice of all such solicitations to relevant organizations such as, but not limited to, the Colorado Black Chamber of Commerce, Rocky Mountain Minority Supplier Development Council, Hispanic Contractors of Colorado, and the Colorado Women's Chamber of Commerce. Notices will be published or provided no less than 10 calendar days before bids are due on the work. In addition to all required formal advertising, including requirements regarding Good Faith Efforts or Modified Good Faith Efforts, if applicable, the Contractor may also utilize other reasonable means of solicitation, which shall include, but need not be limited to, letters, facsimile transmissions, telephone communications and e-mail.

B. For each Work Order issued by the City and intended for bidding by the Contractor, the Contractor will conduct at least one Pre-bid Information Meeting, as shall be announced in published notices, which all interested subcontractors and suppliers may attend, and at which the Contractor will present information and answer questions about the work. DSBO shall attend the Pre-bid Information Meeting and provide to Contractor information and documents required for advertising and bidding of Work Orders, including but not limited to those documents identified in Section 6 of this Compliance Plan.

C. Contractor shall utilize the City's M/WBE directory in its selection of participating M/WBE subcontractors. Contractor shall also encourage all non-M/WBE subcontractors to utilize the directory when soliciting any of their own sub-subcontractors or suppliers for the Project.

D. Hensel Phelps will receive the proposals in the presence of the City and the proposals will be opened in the presence of designated City representatives. The subcontractor's proposals will be reviewed and a detailed scope review will be performed to ensure complete scope has been included and full contract compliance. After scope review is performed, the Contractor will submit its proposal to the City for the Work Order. After Contractor receives City approval and Notice to Proceed (NTP) for the applicable Work Order, notification will be issued to the successful subcontractor.

E. The Contractor will send to each bidder/proposer, a Notice of Selection for each subcontract for which it solicited M/WBE participation, no later than 30 days after it has entered into the subcontract, so that unsuccessful bidders/proposers are aware of the result of the bid/proposal process.

F. As an additional effort to inform the M/WBE community of the Project and Work Orders, and to maximize recruitment efforts, Hensel Phelps will host Pre-Work Order Informational Meetings and other outreach events to provide information on the prequalification process, Work Orders, bid packages and procurement schedules. Hensel

Phelps will host these outreach events to coincide with the delivery schedule of the Work Orders. All such efforts shall be consistent with §§ 28-61 and 28-66 of the M/WBE Code.

G. The Pre-Work Order Informational Meeting will provide the local M/WBE and subcontracting community an opportunity to discuss concerns and pose questions regarding scope ambiguities, contract language and conflicts with competing projects. These meetings also afford Hensel Phelps the time to react accordingly. Project details, including procurement approach, contract administration, quality, safety and community participation will be discussed with the potential subcontractors. City Officials and Contract Administration managers will be notified of every event and will be invited to attend accordingly. If during outreach efforts, Contractor identifies a firm which may be eligible for City M/WBE certification but is not so certified, Contractor will direct the firm to DSBO and encourage the firm to pursue certification.

H. No part of this Section 4 shall waive or excuse compliance with Good Faith Effort requirements, Modified Good Faith Effort requirements, Section 5 of this Compliance Plan, §§ 28-62, 28-64, 28-67, 28-69, 28-75, or other applicable provisions of the Contract.

SECTION 5: M/WBE PARTICIPATION; MAINTAINING COMMITMENTS; GOOD FAITH EFFORTS; MODIFIED GOOD FAITH EFFORTS

A. Meeting M/WBE Participation Goals: When issuing each Work Order for bid under the Contract, the Contractor is required to meet or exceed the goal percentage of M/WBE participation approved for that Work Order.

B. The M/WBE participation percentage will be calculated by dividing the total value of the M/WBE participation by the total dollar amount for the applicable Work Order. The Contractor will count M/WBE participation and identify participating MBE and WBE subcontractors in accordance with the M/WBE Code, including § 28-63 (through the use of Letters of Intent), D.R.M.C., Rule VII(C), and the requirements of the Contract and this Compliance Plan.

C. DBSO shall have prompt, full and complete access, upon reasonable request to Contractor, to all Contractor and subcontractor personnel, books, records required to monitor and ensure compliance with the Code, Rules and this Compliance Plan.

D. The Contractor will report to DSBO the total M/WBE participation obtained for each Work Order. No later than five (5) days after issuing the Notice to Proceed for the applicable Work Order, the Contractor will submit to DSBO, for each M/WBE subcontractor or supplier with whom it contracts, a schedule of work, Letter(s) of Intent and other documentation in accordance with Section 6 below.

E. The Contractor will document its efforts to obtain M/WBE participation for each Work Order and submit such documentation to DSBO upon request by DSBO at any time.

F. As required by Rule VII(C)(4), DSBO shall require Contractor to demonstrate its detailed methodology for dividing work under an applicable Work Order into economically feasible units calculated to enhance and maximize M/WBE participation opportunities.

G. Failure to Meet the Goal; Good Faith Efforts: Due to certain circumstances it is possible Contractor could fall short of meeting the participation goal for a Work Order. In such cases, the Contractor shall be required to demonstrate its Good Faith Efforts, consistent with § 28-62(b), D.R.M.C., to obtain M/WBE participation for each Work Order under the Contract. The minimum level of these efforts is specified in § 28-62(b), D.R.M.C. and under the Rule VII(C) and (D).

H. As required by D.R.M.C. §28-73, the Contractor shall immediately inform the DSBO in writing of any agreed-upon increase or decrease in the scope of work of the applicable Work Order which affects the dollar value of Work Order, regardless of whether it has been reduced to writing at the time of notification. Any change in the scope of work which increases the dollar value of the Work Order, whether or not such change is within the scope of work designated for performance by an MBE or WBE under any subcontract, shall be contemporaneously submitted to DSBO. Those changes to the scope of work that cannot be performed by existing project participants (the Contractor, subcontractors, suppliers, etc.) shall be subject to a goal for MBEs and WBEs equal to the original committed goal for the applicable Work Order. The Contractor remains obligated to satisfy the goal under the Work Order for the changed scope of work by soliciting new MBEs or WBEs.

I. Modified Good Faith Efforts. If, following award to the MBE or WBE, an MBE or WBE has its certification terminated for reasons other than expiration of certification, or graduation from certification, or an MBE or WBE fails to perform a commercially useful function, the value of which was originally counted toward satisfaction of the goal, or an MBE or WBE voluntarily withdraws its participation on the contract and the Contractor can demonstrate that such termination or failure did not result from any action or inaction, whether direct or indirect, of or by the Contractor, such termination of certification or failure of the MBE or WBE to perform shall not be deemed to affect compliance with the project goal, and shall not be deemed a breach of the contract; provided, however, that the terminated MBE or WBE is substituted with another MBE or WBE, performing the same commercially useful function and dollar amount, or that Modified Good Faith Efforts to substitute another MBE or WBE are demonstrated in accordance with §28-75(c), D.R.M.C. The Contractor shall provide to the Director the documentation described in § 28-75(c) with respect to the changed dollar value of the Contract.

J. The Contractor acknowledges that it has a continuing duty, under D.R.M.C. §§ 28-72, 28-73, and 28-75, to maintain, throughout the duration of the Contract, and during all work performed under a Work Order, compliance with the level of MBE and WBE

participation committed to under this Compliance Plan, and that such commitment is a material condition of the Contract.

SECTION 6: COMPLIANCE DOCUMENTS AND REPORTING

A. The Contractor will submit the following documentation, properly completed and submitted monthly or when otherwise required by DSBO.

1. Contractor background information form*
2. DSBO Schedule of Work form*
3. Subcontractor background information form for all subcontractors*
4. M/WBE Letters of Intent
5. Monthly contractor's certification of payment forms (participation report)
6. DSBO change order forms
7. M/WBE final lien release forms
8. B2G online payment verification

(*due at NTP + 5 days; revisions shall be submitted no later than 5 days after occurrence)

B. The Contractor shall document its progress in seeking and obtaining M/WBE participation as required by DSBO. Records of the Contractor's efforts to solicit M/WBE subcontractor and supplier participation, shall be maintained and reported monthly to DSBO, or as otherwise required, including:

1. Dates of solicitation
2. Names, addresses and telephone numbers of all M/WBE firms contacted.
3. Description of efforts made to contact M/WBE firms.
4. Description of information provided to M/WBE firms.
5. Description of the process and outcome.
6. Advertisements soliciting bids from M/WBE firms in local community publications or construction industry related publications.
7. Schedules of prebid meetings to inform M/WBE and non-M/WBE subcontractors and suppliers of opportunities to participate.
8. Evidence that the Contractor provided M/WBE subcontractors and suppliers necessary access to and adequate time to review all project documents.
9. If applicable, all documentation required to establish the Contractor's compliance with Good Faith Efforts required by City Code, specifically the items enumerated in §§28-62(b)(2) through 28-62(b)(10). D.R.M.C.
10. If applicable, all documentation required to establish the Contractor's compliance with Modified Good Faith Efforts required by City Code, specifically the items enumerated in §§28-73 and 28-75(c).

SECTION 7: PLAN ADMINISTRATION; MONITORING; CLOSEOUT

A. DSBO shall have prompt, full and complete access to all Contractor and subcontractor personnel, books and records required to monitor and assure performance of this Compliance Plan.

B. The Contractor's personnel identified in Section 2 above, shall be responsible for administering and monitoring the Contractor's performance of this Compliance Plan.

C. Actual M/WBE participation will be calculated in accordance with the M/WBE Code, including § 28-63, D.R.M.C., and applicable Rules. The Contractor will submit to DSBO a monthly tracking report demonstrating the M/WBE participation that has been achieved.

D. Reviews and reconciliation of M/WBE participation shall, at a minimum, be performed on a quarterly basis. The schedule for reviews shall be mutually agreed upon by Contractor and DSBO.

E. The Contractor acknowledges that, in accordance with §28-77, D.R.M.C., the City may impose monetary penalties and/or withhold payment in the event of Contractor's non-compliance with the M/WBE Code and this Compliance Plan.

F. The Contractor will use the following methodology for final reconciliation of M/WBE participation performance achieved during the Contract term, measured against the established project goal.

1. The Contractor will present copies of all signed DSBO Final Lien Release forms for M/WBE firms utilized for participation on the Contract.

2. DSBO will compare the Final Monthly Participation Report submitted by the Contractor to determine if the Final Lien Release dollar figures match what is contained within the Final Monthly Participation Report.

3. Final Compliance shall be achieved when the Contractor establishes to the Director's satisfaction, that it has remitted payments to M/WBE firms utilized on the Project; that it utilized M/WBE firms in accordance with each such firm's Letter of Intent; and that the amount of payments to M/WBE firms equals or exceeds the assigned M/WBE goal for the total amount of the Contract.

4. Failure to achieve final compliance may subject the Contractor to sanctions, in accordance with, §28-77, D.R.M.C. As provided in such Code, sanctions may include, but are not limited to, assessment by the Director of a monetary penalty against the Contractor in an amount not more than 150% of the contract amount for each MBE or WBE involved. Any such monetary penalty leveled by the Director shall be withheld from the final payment due to the Contractor, and any amount that remains due and owing to the City may be collected pursuant to §28-77.

5. The Contractor may seek review of any such determination by the Director to levy sanctions through the dispute resolution process set forth in the Construction Contract.

SECTION 8: NON-COMPLIANCE; SANCTIONS; REMEDIATION PLAN

A. At all times, DSBO shall monitor the Contractor's compliance with this Plan and the M/WBE Code and Rules. The Contractor shall fully cooperate with DSBO's compliance monitoring and auditing efforts, including DSBO's investigation of any alleged or suspected non-compliance by the Contractor.

B. If the Director has reason to believe that the Contractor is not in compliance with this Plan or with the M/WBE Code, the Director shall give the Contractor written notice of non-compliance, citing the reasons why the Contractor is not in compliance, and giving the Contractor thirty (30) days in which to submit a remediation plan for the Director's review and acceptance. The remediation plan shall demonstrate how the Contractor will cure such non-compliance, and if such non-compliance consists of failure to obtain or maintain M/WBE participation at the committed level, that the Contractor's M/WBE participation level will again achieve the committed level, and that the Contractor will ultimately achieve the committed participation goal for the contract.

C. The Contractor shall, within such thirty (30) day period, deliver to the Director a written remediation plan the Director's review and approval.

D. The Director may issue a written determination of non-compliance and the sanction which the Director has elected to impose as a consequence:

1. If the Contractor does not respond within the time allowed; or

2. If the Contractor fails to submit a satisfactory remediation plan; or

3. If a Contractor submits an acceptable remediation plan but thereafter fails to comply with the plan.

E. The Contractor may contest a determination issued under Section 8(D), by requesting a hearing within 30 days after the date of such determination, as provided in § 28-33, D.R.M.C.

SECTION 9: MEDIATION

The Contractor will provide a process to resolve disputes that occur between an MBE or WBE and any non-M/WBE subcontractors or suppliers under the Contract. The Contractor will document such disputes and inform DSBO of the steps the Contractor plans to take to resolve the dispute. The Contractor may ask DSBO to assist in the resolution process it has developed. The Contractor will document and notify DSBO if those disputes have been resolved and inform

DSBO of any disputes it was unable to resolve. DSBO will notify the Contractor of any complaints received by DSBO from M/WBE firms regarding a dispute they are experiencing with either a subcontractor or the Contractor.

IN WITNESS WHEREOF, Contractor has executed and agrees to abide by the terms of this Compliance Plan as of the ____ day of _____, 20____.

Contractor

By:_____

EXHIBIT Q

PREVAILING WAGE RATES

DENVER
THE MILE HIGH CITY

Office of Human Resources
Denver's Human Resource Agency

201 W. Colfax, Department 412
Denver, CO 80202
p: 720.913.5751
f: 720.913.5720
www.denvergov.org/humanresources

TO: All Users of the City of Denver Prevailing Wage Schedules

FROM: Susan Keller, Human Resources Technician II

DATE: Wednesday, November 22, 2017

SUBJECT: Latest Change to Prevailing Wage Schedules

Please be advised, prevailing wage rates for some building, heavy, highway, and residential construction trades have not been updated by the United States Department of Labor (DOL) since March 1, 2002. The Career Service Board, in their meeting held on April 21, 2011, approved the use of the attached supplemental wage rates until prevailing wage rates for these classifications of work are again published by the United States Department of Labor in accordance with the Davis-Bacon Act.

The attached Prevailing Wage Schedule is effective as of **Friday, November 10, 2017** and applies to the City and County of Denver for **BUILDING CONSTRUCTION PROJECTS** (does not include residential construction consisting of single family homes and apartments up to and including 4 stories) in accordance with the Denver Revised Municipal Code, Section 20-76(c).

General Wage Decision No. CO170030
Superseded General Decision No. CO20160030
Modification No. 13
Publication Date: 11/10/2017
(4 pages)

Unless otherwise specified in this document, apprentices shall be permitted only if they are employed pursuant to, and individually registered in, a bona fide apprenticeship program registered with the U.S. Department of Labor (DOL). The employer and the individual apprentice must be registered in a program, which has received prior approval, by the DOL. Any employer, who employs an apprentice and is found to be in violation of this provision, shall be required to pay said apprentice the full journeyman scale.

Attachments as listed above.

General Decision Number: CO170030 11/10/2017 CO30

Superseded General Decision Number: CO20160030

State: Colorado

Construction Type: Building

County: Denver County in Colorado.

BUILDING CONSTRUCTION PROJECTS (does not include single family homes or apartments up to and including 4 stories).

Note: Under Executive Order (EO) 13658, an hourly minimum wage of $10.20 for calendar year 2017 applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 2015. If this contract is covered by the EO, the contractor must pay all workers in any classification listed on this wage determination at least $10.20 (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on the contract in calendar year 2017. The EO minimum wage rate will be adjusted annually. Additional information on contractor requirements and worker protections under the EO is available at www.dol.gov/whd/govcontracts.

Modification Number	Publication Date
0	01/06/2017
1	01/13/2017
2	01/27/2017
3	02/03/2017
4	04/07/2017
5	04/21/2017
6	05/19/2017
7	05/26/2017
8	06/02/2017
9	06/09/2017
10	07/21/2017
11	08/04/2017
12	08/18/2017
13	11/10/2017

* ASBE0028-002 07/01/2017

	Rates	Fringes
ASBESTOS WORKER/HEAT & FROST INSULATOR - MECHANICAL (Duct, Pipe & Mechanical System Insulation)	$ 30.73	14.23

CARP0055-002 11/01/2016

	Rates	Fringes

CARPENTER (Drywall Hanging
Only).....$ 26.25 8.64

CARP1607-001 06/01/2016

	Rates	Fringes
MILLWRIGHT	$ 31.38	12.70

ELEC0068-012 06/01/2017

	Rates	Fringes
ELECTRICIAN (Includes Low Voltage Wiring)	$ 34.70	14.97

ELEV0025-001 01/01/2017

	Rates	Fringes
ELEVATOR MECHANIC	$ 42.35	31.58

FOOTNOTE:
a.Vacation: 6%/under 5 years based on regular hourly rate for all hours worked. 8%/over 5 years based on regular hourly rate for all hours worked.
b. PAID HOLIDAYS: New Year's Day; Memorial Day; Independence Day; Labor Day; Veterans' Day; Thanksgiving Day; the Friday after Thanksgiving Day; and Christmas Day.

ENGI0009-017 05/01/2017

	Rates	Fringes
POWER EQUIPMENT OPERATOR (Crane)		
141 tons and over	$ 29.82	10.10
50 tons and under	$ 27.75	10.10
51 to 90 tons	$ 27.92	10.10
91 to 140 tons	$ 28.55	10.10

IRON0024-009 05/01/2017

	Rates	Fringes
IRONWORKER, ORNAMENTAL	$ 26.30	12.25

IRON0024-010 05/01/2017

	Rates	Fringes
IRONWORKER, STRUCTURAL	$ 26.30	12.25

PAIN0079-006 08/01/2017

	Rates	Fringes

PAINTER (Brush, Roller and Spray; Excludes Drywall Finishing/Taping).....$ 20.50 8.41

PAIN0079-007 08/01/2017

	Rates	Fringes
DRYWALL FINISHER/TAPER.....$	21.20	8.41

PAIN0419-001 07/01/2016

	Rates	Fringes
SOFT FLOOR LAYER (Vinyl and Carpet).....$	20.00	10.83

PAIN0930-002 07/01/2017

	Rates	Fringes
GLAZIER.....$	31.02	9.37

PLUM0003-009 06/01/2017

	Rates	Fringes
PLUMBER (Excludes HVAC Duct, Pipe and Unit Installation).....$	34.53	16.44

PLUM0208-008 06/01/2017

	Rates	Fringes
PIPEFITTER (Includes HVAC Pipe and Unit Installation; Excludes HVAC Duct Installation).....$	33.30	17.65

SFCO0669-002 04/01/2017

	Rates	Fringes
SPRINKLER FITTER (Fire Sprinklers).....$	36.73	20.47

SHEE0009-004 07/01/2017

	Rates	Fringes
SHEET METAL WORKER (Includes HVAC Duct Installation; Excludes HVAC Pipe and Unit Installation).....$	33.26	16.61

SUCO2013-006 07/31/2015

	Rates	Fringes
BRICKLAYER	$ 21.96	0.00
CARPENTER (Acoustical Ceiling Installation Only)	$ 22.40	4.85
CARPENTER (Metal Stud Installation Only)	$ 17.68	0.00
CARPENTER, Excludes Acoustical Ceiling Installation, Drywall Hanging, and Metal Stud Installation	$ 21.09	6.31
CEMENT MASON/CONCRETE FINISHER	$ 20.09	7.03
LABORER: Common or General	$ 14.49	5.22
LABORER: Mason Tender - Brick	$ 15.99	0.00
LABORER: Mason Tender - Cement/Concrete	$ 16.00	0.00
LABORER: Pipelayer	$ 16.96	3.68
OPERATOR: Backhoe/Excavator/Trackhoe	$ 20.78	5.78
OPERATOR: Bobcat/Skid Steer/Skid Loader	$ 19.10	3.89
OPERATOR: Grader/Blade	$ 21.50	0.00
ROOFER	$ 16.56	0.00
TRUCK DRIVER: Dump Truck	$ 17.34	0.00
WATERPROOFER	$ 12.71	0.00

WELDERS - Receive rate prescribed for craft performing operation to which welding is incidental.

Office of Human Resources
Supplemental rates
(Specific to the Denver projects)
Supp #101, Date: 11-28-2016

Classification		Base	Fringe
Boilermakers		$30.97	$21.45
Iron Worker, Reinforcing		$18.49	$3.87
Journeyman Tile Setter		$26.83	$8.48
Laborers: Concrete Saw		$13.89	-
Paper Hanger		$20.15	$6.91
Plasters		$24.60	$12.11
Plaster Tenders		$10.79	-
Power Equipment Operators (Concrete Mixers):			
	Less than 1 yd	$23.67	$10.67
	1 yd and over	$23.82	$10.68
Power Equipment Operators:			
	Loader up to and incl 6 cu yd	$23.67	$10.67
	Motor Grader	$23.97	$10.70
	Roller	$23.67	$10.67
	Drillers	$23.97	$10.70
	Loaders over 6 cu yd	$23.82	$10.68
	Oilers	$22.97	$10.70
	Mechanic	$18.48	
Tile Finisher-Floor Grinder-Base Grinder		$20.87	$8.42
Truck Drivers	Flatbed	$19.14	$10.07
	Semi	$19.48	$10.11

- Caulkers—Receive rate prescribed for craft performing operation to which caulking is incidental .i.e. glazier, painter, brick layer, cement mason.
- Use the “Carpenters, Excludes Acoustical Ceiling Installation, Drywall Hanging, and Metal Stud Installation” rates published by the Federal Davis-Bacon rates for batt insulation, pre-stress concrete and tilt up concrete walls.
- Use the “Laborer—Common”, for General Housekeeping, Demolition, Final Cleanup and Indoor Fence Installer.
- Trade classification workers cannot be classified as common laborers for performing incidental cleanup from the installation of their craft. Common Laborers perform final cleanup of the entire jobsite.
- Go to www.denvergov.org/Auditor to view the Prevailing Wage Clarification Document for a list of complete classifications used.

Office of Human Resources
Denver's Human Resource Agency

201 W. Colfax, Department 412
Denver, CO 80202
p: 720.913.5751
f: 720.913.5720
www.denvergov.org/humanresources

TO: All Users of the City of Denver Prevailing Wage Schedules

FROM: Susan Keller, Human Resources Technician

DATE: Wednesday, November 22, 2017

SUBJECT: Latest Change to Prevailing Wage Schedules

Please be advised, prevailing wage rates for some building, heavy, highway, and residential construction trades have not been updated by the United States Department of Labor (DOL) since March 1, 2002. The Career Service Board, in their meeting held on April 21, 2011, approved the use of the attached supplemental wage rates until prevailing wage rates for these classifications of work are again published by the United States Department of Labor in accordance with the Davis-Bacon Act.

The effective date for this publication will be **Friday, November 10, 2017** and applies to the City and County of Denver for **HEAVY CONSTRUCTION PROJECTS** in accordance with the Denver Revised Municipal Code, Section 20-76(c).

General Wage Decision No. CO170012
Superseded General Decision No. CO20160012
Modification No. 11
Publication Date: 11/10/17
(8 pages)

Unless otherwise specified in this document, apprentices shall be permitted only if they are employed pursuant to, and individually registered in, a bona fide apprenticeship program registered with the U.S. Department of Labor (DOL). The employer and the individual apprentice must be registered in a program, which has received prior approval, by the DOL. Any employer, who employs an apprentice and is found to be in violation of this provision, shall be required to pay said apprentice the full journeyman scale.

Attachments as listed above.

General Decision Number: CO170012 11/10/2017 CO12

Superseded General Decision Number: CO20160012

State: Colorado

Construction Type: Heavy

Counties: Adams, Arapahoe, Boulder, Broomfield, Denver, Douglas, El Paso, Jefferson, Larimer, Mesa, Pueblo and Weld Counties in Colorado.

HEAVY CONSTRUCTION PROJECTS

Note: Under Executive Order (EO) 13658, an hourly minimum wage of $10.20 for calendar year 2017 applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 2015. If this contract is covered by the EO, the contractor must pay all workers in any classification listed on this wage determination at least $10.20 (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on the contract in calendar year 2017. The EO minimum wage rate will be adjusted annually. Additional information on contractor requirements and worker protections under the EO is available at www.dol.gov/whd/govcontracts.

Modification Number	Publication Date
0	01/06/2017
1	01/20/2017
2	02/03/2017
3	04/07/2017
4	05/19/2017
5	05/26/2017
6	06/02/2017
7	06/09/2017
8	07/21/2017
9	09/22/2017
10	11/03/2017
11	11/10/2017

* ASBE0028-001 07/01/2017

	Rates	Fringes
Asbestos Workers/Insulator (Includes application of all insulating materials, protective coverings, coatings and finishings to all types of mechanical systems)	$ 30.73	14.23

BRCO0007-004 01/01/2017

ADAMS, ARAPAHOE, BOULDER, BROOMFIELD, DENVER, DOUGLAS AND JEFFERSON COUNTIES

	Rates	Fringes

BRICKLAYER.....$ 26.62 7.99

BRCO0007-006 05/01/2017

EL PASO AND PUEBLO COUNTIES

	Rates	Fringes
BRICKLAYER	$ 25.32	9.90

ELEC0012-004 09/01/2016

PUEBLO COUNTY

	Rates	Fringes
ELECTRICIAN		
Electrical contract over $1,000,000	$ 28.00	11.00+3%
Electrical contract under $1,000,000	$ 24.85	11.00+3%

ELEC0068-001 06/01/2017

ADAMS, ARAPAHOE, BOULDER, BROOMFIELD, DENVER, DOUGLAS, JEFFERSON, LARIMER, AND WELD COUNTIES

	Rates	Fringes
ELECTRICIAN	$ 34.70	14.97

ELEC0111-001 09/01/2017

	Rates	Fringes
Line Construction:		
Groundman	$ 25.68	25.25%+$5.75
Line Equipment Operator	$ 31.35	25.25% + $5.75
Lineman and Welder	$ 44.92	25.25%+$5.75

ELEC0113-002 06/01/2017

EL PASO COUNTY

	Rates	Fringes
ELECTRICIAN	$ 31.00	15.38

ELEC0969-002 06/01/2015

MESA COUNTY

	Rates	Fringes
ELECTRICIAN	$ 24.00	7.92

ENGI0009-001 05/01/2017

	Rates	Fringes
Power equipment operators:		
Blade: Finish	$ 27.92	10.10

Blade: Rough	$ 27.60	10.10
Bulldozer	$ 27.60	10.10
Cranes: 50 tons and under	$ 27.75	10.10
Cranes: 51 to 90 tons	$ 27.92	10.10
Cranes: 91 to 140 tons	$ 28.55	10.10
Cranes: 141 tons and over	$ 29.82	10.10
Forklift	$ 27.22	10.10
Mechanic	$ 28.08	10.10
Oiler	$ 26.84	10.10
Scraper: Single bowl under 40 cubic yards	$ 27.75	10.10
Scraper: Single bowl, including pups 40 cubic yards and over and tandem bowls	$ 27.92	10.10
Trackhoe	$ 27.75	10.10

IRON0024-003 05/01/2017

	Rates	Fringes
Ironworkers: Structural	$ 26.30	21.45

LABO0086-001 05/01/2009

	Rates	Fringes
Laborers:		
Pipelayer	$ 18.68	6.78

PLUM0003-005 06/01/2017

ADAMS, ARAPAHOE, BOULDER, BROOMFIELD, DENVER, DOUGLAS, JEFFERSON, LARIMER AND WELD COUNTIES

	Rates	Fringes
PLUMBER	$ 39.08	16.44

PLUM0058-002 07/01/2017

EL PASO COUNTY

	Rates	Fringes
Plumbers and Pipefitters	$ 36.50	14.10

PLUM0058-008 07/01/2017

PUEBLO COUNTY

	Rates	Fringes
Plumbers and Pipefitters	$ 36.50	14.10

PLUM0145-002 07/01/2016

MESA COUNTY

	Rates	Fringes

Plumbers and Pipefitters	$ 35.17	11.70

PLUM0208-004 06/01/2016

ADAMS, ARAPAHOE, BOULDER, BROOMFIELD, DENVER, DOUGLAS, JEFFERSON, LARIMER AND WELD COUNTIES

	Rates	Fringes
PIPEFITTER	$ 37.10	16.62

SHEE0009-002 07/01/2017

	Rates	Fringes
Sheet metal worker	$ 33.26	16.61

TEAM0455-002 07/01/2017

	Rates	Fringes
Truck drivers:		
Pickup	$ 20.91	4.22
Tandem/Semi and Water	$ 21.54	4.22

SUCO2001-006 12/20/2001

	Rates	Fringes
BOILERMAKER	$ 17.60	
Carpenters:		
Form Building and Setting	$ 16.97	2.74
All Other Work	$ 15.14	3.37
Cement Mason/Concrete Finisher	$ 17.31	2.85
IRONWORKER, REINFORCING	$ 18.83	3.90
Laborers:		
Common	$ 11.22	2.92
Flagger	$ 8.91	3.80
Landscape	$ 12.56	3.21
Painters:		
Brush, Roller & Spray	$ 15.81	3.26
Power equipment operators:		
Backhoe	$ 16.36	2.48
Front End Loader	$ 17.24	3.23
Skid Loader	$ 15.37	4.41

WELDERS - Receive rate prescribed for craft performing operation to which welding is incidental.

Office of Human Resources
Supplemental rates
(Specific to the Denver Projects)
(Supp #74, Date: 02-03-2012)

Classification		Base	Fringe
Ironworkers (Ornamental)		$24.80	$10.03
Laborers: Janitors/Yardmen		$17.68	$8.22
Laborers:			
	GROUP 1	$18.18	$8.27
	GROUP 2	$21.59	$8.61
Laborers: (Tunnel)			
	GROUP 1	$18.53	$8.30
	GROUP 2	$18.63	$8.31
	GROUP 3	$19.73	$8.42
	GROUP 4	$21.59	$8.61
	GROUP 5	$19.68	$8.42
Laborers (Removal of Asbestos)		$21.03	$8.55
Line Construction:			
	Lineman, Gas Fitter/Welder	$36.88	$9.55
	Line Eq Operator/Line Truck Crew	$25.74	$8.09
Millwrights		$28.00	$10.00
Power Equipment Operators (Tunnels Above and Below Ground, shafts and raises):			
	GROUP 1	$25.12	$10.81
	GROUP 2	$25.47	$10.85
	GROUP 3	$25.57	$10.86
	GROUP 4	$25.82	$10.88
	GROUP 5	$25.97	$10.90
	GROUP 6	$26.12	$10.91
	GROUP 7	$26.37	$10.94
Power Equipment Operators:			
	GROUP 1	$22.97	$10.60
	GROUP 2	$23.32	$10.63
	GROUP 3	$23.67	$10.67
	GROUP 4	$23.82	$10.68
	GROUP 5	$23.97	$10.70
	GROUP 6	$24.12	$10.71
	GROUP 7	$24.88	$10.79
Truck Drivers:			
	GROUP 1	$18.42	$10.00
	GROUP 2	$19.14	$10.07
	GROUP 3	$19.48	$10.11
	GROUP 4	$20.01	$10.16
	GROUP 5	$20.66	$10.23
	GROUP 6	$21.46	$10.31

POWER EQUIPMENT OPERATOR CLASSIFICATIONS
(TUNNELS ABOVE AND BELOW GROUND, SHAFTS, AND RAISES):

GROUP 1 - Brakeman
GROUP 2 - Motorman
GROUP 3 - Compressor
GROUP 4 - Air Tractors; Grout Machine; Gunnite Machine; Jumbo Form
GROUP 5 - Concrete Placement Pumps; Mucking Machines and Front End Loaders, Underground, Slusher; Mine Hoist Operator; Mechanic
GROUP 6 - Mechanic Welder
GROUP 7 - Mole

NOTE: Any equipment listed below being used in tunnel work, below or above ground shall be paid not less than $2.00 per hour above the listed wage rates.

POWER EQUIPMENT OPERATOR CLASSIFICATIONS:

GROUP 1 - Air compressor, brakeman, drill operator - smaller than Watson 2500 and similar, operators of 5 or more light plants, welding machines, generators, single unit conveyor, pumps, vacuum well point system, tractor, under 70 hp with or without attachments compressors, 360 C.F.M. or less.

GROUP 2 - Conveyor, handling **building** materials, ditch witch and similar trenching machine, haulage motor man, pugmill, portable screening plant with or without a spray bar, screening plants, with classifier.

GROUP 3 - Asphalt screed, asphalt plant, backfiller, bituminous spreader or laydown machine; cableway signalman, caisson drill, William MF, similar or larger; C.M.I. and similar, concrete batching plants, concrete finish machine, concrete gang saw on concrete paving, concrete mixer, less than 1 yd., concrete placement pumps, under 8 inches, distributors, bituminous surfaces dozer, drill, diamond or core, drill rigs, rotary, churn, or cable tool, elevating graders, elevator operator, equipment, lubricating and service engineer, grout machine, gunnite machine, hoist, 1 drum, horizontal directional drill operator, sandblasting machine, single unit protable crusher, with or without washer, tie tamper, wheel mounted, tractor, 70 hp and over with or without attachments, trenching machine operator, winch on truck.

GROUP 4 - Cable operated power shovels, draglines, articulated truck operator, clamshells, and backhoes, 5 cubic yards and under, concrete mixer over 1 cubic yard, concrete paver 34E or similar, concrete placement pumps, 8 inches and over, grade checker, hoist, 2 drums, hydraulic backhoe, 3/4 yds and over, loader, over 6 cubic yards, mechanic, mixer mobile, multiple unit portable crusher, with or without washer; pile driver, tractor with side boom, roto- mill and similar, welder.

GROUP 5 - Cable operated power shovels, draglines, clamshells and backhoes over 5 cubic yards, caisson drill Watson 2500 similar or larger, hoist 3 drum or more, mechanic – welder (heavy-duty).

GROUP 6 - Cableway, derrick, quad nine push unit, wheel excavator, belt or elevating loader

GROUP 7 - tower cranes all types

LABORER CLASSIFICATIONS:

GROUP 1 –Erosion Control, Dowel Bars; Fence Erectors; Gabion Basket and Reno mattresses; Signaling, Metal Mesh; Stake Caser; Traffic Control Devices; Tie Bars and Chairs in Concrete; Paving; Waterproofing Concrete; Air, Gas, Hydraulic Tools and Electrical Tool Operators; Barco Hammers; Cutting Torches; drill; diamond and core drills; Core, diamond, air track including but not limited to; Joy, Mustang, PR-143, 220 Gardner-**Denver**, Hydrosonic, and water blaster operator; Chuck Tender; Electric hammers; Jackhammers; Hydraulic Jacks; Tampers; Air Tampers; Automatic Concrete Power Curbing Machines; Concrete Processing Material; Concrete Tender; Operators of concrete saws on pavement (other than gangsaws); Power operated Concrete Buggies; Hot Asphalt Labor; Asphalt Curb Machines; Paving Breakers; Transverse Concrete Conveyor Operator; Cofferdams; Boxtenders; Caisson 8' to 12'; Caisson Over 12'; Jackhammer Operators in Caissons over 12'; Labor applicable to Pipe coating or Wrapping; Pipe Wrappers, Plant and Yard; Relining

Pipe; Hydroliner (a plastic may be used to waterproof); Pipelayer on Underground Bores; Sewer, Water, Gas, Oil Conduit; Enamalers on Pipe, inside and out, Mechanical Grouters; Monitors; Jeep Holiday Detector Men; Pump Operators; Rakers; Vibrators; Hydro- broom, Mixer Man; Gunnite Nozzelmen; Shotcrete Operator; and chain saws, gas and electric; Sand Blaster; Licensed Powdermen; Powdermen and Blaster; Siphons; Signalmen; Dumpman/spotter; Grade Checker.

GROUP 2 - Plug and galleys in dams; Scalers; any work on or off Bridges 40' above the ground performed by Laborers working from a Bos'n Chair, Swing Stage, Life Belt, or Block and Tackle as a safety requirement.

TUNNEL LABORER CLASSIFICATIONS:

GROUP 1 - Outside Laborer - Above ground

GROUP 2 - Minimum Tunnel Laborer, Dry Houseman

GROUP 3 - Cable or Hose Tenders, Chuck Tenders, Concrete Laborers, Dumpmen, Whirley Pump Operators

GROUP 4 - Tenders on Shotcrete, Gunniting and Sand Blasting;
Tenders, core and Diamond Drills; Pot Tenders

GROUP 5 - Collapsible Form Movers and Setters; Miners; Machine Men and Bit Grinders; Nippers; Powdermen and Blasters; Reinforcing Steel Setters; Timbermen (steel or wood tunnel support, including the placement of sheeting when required); and all Cutting and Welding that is incidental to the Miner's work; Tunnel Liner Plate Setters; Vibrator Men, Internal and External; Unloading, stopping and starting of Moran Agitator Cars; Diamond and Core Drill Operators; Shotcrete operator; Gunnite Nozzlemen; Sand Blaster; Pump Concrete Placement Men.

Laborers (Removal of Asbestos) Removal or encapsulation of Asbestos Material (including removal of asbestos from mechanical systems that are going to be scraped) and work involving the removal, handling, or dealing with toxic or hazardous waste.

TRUCK DRIVER CLASSIFICATIONS:

GROUP 1 - Sweeper Truck, Flat Rack Single Axle and Manhaul, Shuttle Truck or Bus.

GROUP 2 - Dump Truck Driver to and including 6 cubic yards, Dump Truck Driver over 6 cubic yards to and including 14 cubic yards, Straddle Truck Driver, Liquid and Bulk Tankers Single Axle, Euclid Electric or Similar, Multipurpose Truck Specialty and Hoisting.

GROUP 3 - Truck Driver Snow Plow.

GROUP 4 - Cement Mixer Agitator Truck over 10 cubic yards to and including 15 cubic yards.

WELDERS: Receive rate prescribed for craft performing operation to which welding is incidental.

Career Service Authority
Denver's Human Resource Agency

201 W. Colfax, Department 412
Denver, CO 80202
p: 720.913.5751
f: 720.913.5720
www.denvergov.org/csa

TO: All Users of the City of Denver Prevailing Wage Schedules

FROM: Susan Keller, Human Resources Technician

DATE: Thursday, October 5, 2017

SUBJECT: Latest Change to Prevailing Wage Schedules

Please be advised, prevailing wage rates for some building, heavy, highway, and residential construction trades have not been updated by the United States Department of Labor (DOL) since March 1, 2002. The Career Service Board, in their meeting held on April 21, 2011, approved the use of the attached supplemental wage rates until prevailing wage rates for these classifications of work are again published by the United States Department of Labor in accordance with the Davis-Bacon Act.

The effective date for this publication is **Friday, September 22, 2017** and applies to the City and County of Denver for **HIGHWAY CONSTRUCTION PROJECTS** in accordance with the Denver Revised Municipal Code, Section 20-76(c).

General Wage Decision No. CO170019
Superseded General Decision No. CO20160019
Modification No. 3
Publication Date: 9/22/17
(8 pages)

Unless otherwise specified in this document, apprentices shall be permitted only if they are employed pursuant to, and individually registered in, a bona fide apprenticeship program registered with the U.S. Department. Of Labor (DOL). The employer and the individual apprentice must be registered in a program, which has received prior approval, by the DOL. Any employer, who employs an apprentice and is found to be in violation of this provision, shall be required to pay said apprentice the full journeyman scale.

Attachments as listed above.

General Decision Number: CO170019 09/22/2017 CO19

Superseded General Decision Number: CO20160019

State: Colorado

Construction Type: Highway

Counties: Denver and Douglas Counties in Colorado.

HIGHWAY CONSTRUCTION PROJECTS

Note: Under Executive Order (EO) 13658, an hourly minimum wage of $10.20 for calendar year 2017 applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 2015. If this contract is covered by the EO, the contractor must pay all workers in any classification listed on this wage determination at least $10.20 (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on the contract in calendar year 2017. The EO minimum wage rate will be adjusted annually. Additional information on contractor requirements and worker protections under the EO is available at www.dol.gov/whd/govcontracts.

Modification Number	Publication Date
0	01/06/2017
1	01/27/2017
2	06/09/2017
3	09/22/2017

CARP9901-008 11/01/2016

	Rates	Fringes
CARPENTER (Form Work Only)	$ 25.50	7.47

ELEC0068-016 03/01/2011

	Rates	Fringes
TRAFFIC SIGNALIZATION:		
Traffic Signal Installation		
Zone 1	$ 26.42	4.75%+8.68
Zone 2	$ 29.42	4.75%+8.68

TRAFFIC SIGNAL INSTALLER ZONE DEFINITIONS

Zone 1 shall be a 35 mile radius, measured from the following addresses in each of the following cities:
Colorado Springs - Nevada & Bijou
Denver - Ellsworth Avenue & Broadway
Ft. Collins - Prospect & College
Grand Junction - 12th & North Avenue
Pueblo - I-25 & Highway 50
All work outside of these areas shall be paid Zone 2 rates.

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* ENGI0009-008 05/01/2017

	Rates	Fringes
POWER EQUIPMENT OPERATOR:		
(3)-Hydraulic Backhoe (Wheel Mounted, under 3/4 yds), Hydraulic Backhoe (Backhoe/Loader combination), Drill Rig Caisson (smaller than Watson 2500 and similar), Loader (up to and including 6 cu. yd.)	$ 27.60	10.10
(3)-Loader (under 6 cu. yd.) Denver County	$ 27.60	10.10
(3)-Motor Grader (blade-rough) Douglas County	$ 27.60	10.10
(4)-Crane (50 tons and under), Scraper (single bowl, under 40 cu. yd)	$ 27.75	10.10
(4)-Loader (over 6 cu. yd) Denver County	$ 27.75	10.10
(5)-Drill Rig Caisson (Watson 2500 similar or larger), Crane (51-90 tons), Scraper (40 cu.yd and over),	$ 27.92	10.10
(5)-Motor Grader (blade-finish) Douglas County	$ 27.92	10.10
(6)-Crane (91-140 tons)	$ 28.55	10.10

SUCO2011-004 09/15/2011

	Rates	Fringes
CARPENTER (Excludes Form Work)	$ 19.27	5.08
CEMENT MASON/CONCRETE FINISHER		
Denver	$ 20.18	5.75
Douglas	$ 18.75	3.00
ELECTRICIAN (Excludes Traffic Signal Installation)	$ 35.13	6.83
FENCE ERECTOR (Excludes Link/Cyclone Fence Erection)	$ 13.02	3.20
GUARDRAIL INSTALLER	$ 12.89	3.20
HIGHWAY/PARKING LOT STRIPING:Painter		
Denver	$ 12.62	3.21
Douglas	$ 13.89	3.21
IRONWORKER, REINFORCING (Excludes Guardrail Installation)	$ 16.69	5.45
IRONWORKER, STRUCTURAL		

(Includes Link/Cyclone Fence Erection, Excludes Guardrail Installation)	$ 18.22	6.01
LABORER		
Asphalt Raker	$ 16.29	4.25
Asphalt Shoveler	$ 21.21	4.25
Asphalt Spreader	$ 18.58	4.65
Common or General		
Denver	$ 16.76	6.77
Douglas	$ 16.29	4.25
Concrete Saw (Hand Held)	$ 16.29	6.14
Landscape and Irrigation	$ 12.26	3.16
Mason Tender-Cement/Concrete		
Denver	$ 16.96	4.04
Douglas	$ 16.29	4.25
Pipelayer		
Denver	$ 13.55	2.41
Douglas	$ 16.30	2.18
Traffic Control (Flagger)	$ 9.55	3.05
Traffic Control (Sets Up/Moves Barrels, Cones, Install Signs, Arrow Boards and Place Stationary Flags)(Excludes Flaggers)	$ 12.43	3.22
PAINTER (Spray Only)	$ 16.99	2.87
POWER EQUIPMENT OPERATOR:		
Asphalt Laydown		
Denver	$ 22.67	8.72
Douglas	$ 23.67	8.47
Asphalt Paver		
Denver	$ 24.97	6.13
Douglas	$ 25.44	3.50
Asphalt Roller		
Denver	$ 23.13	7.55
Douglas	$ 23.63	6.43
Asphalt Spreader	$ 22.67	8.72
Backhoe/Trackhoe		
Douglas	$ 23.82	6.00
Bobcat/Skid Loader	$ 15.37	4.28
Boom	$ 22.67	8.72
Broom/Sweeper		
Denver	$ 22.47	8.72
Douglas	$ 22.96	8.22
Bulldozer	$ 26.90	5.59
Concrete Pump	$ 21.60	5.21
Drill		
Denver	$ 20.48	4.71
Douglas	$ 20.71	2.66
Forklift	$ 15.91	4.68
Grader/Blade		
Denver	$ 22.67	8.72
Guardrail/Post Driver	$ 16.07	4.41
Loader (Front End)		
Douglas	$ 21.67	8.22
Mechanic		
Denver	$ 22.89	8.72

Douglas	$ 23.88	8.22
Oiler		
Denver	$ 23.73	8.41
Douglas	$ 24.90	7.67
Roller/Compactor (Dirt and Grade Compaction)		
Denver	$ 20.30	5.51
Douglas	$ 22.78	4.86
Rotomill	$ 16.22	4.41
Screed		
Denver	$ 22.67	8.38
Douglas	$ 29.99	1.40
Tractor	$ 13.13	2.95
TRAFFIC SIGNALIZATION:		
Groundsman		
Denver	$ 17.90	3.41
Douglas	$ 18.67	7.17
TRUCK DRIVER		
Distributor		
Denver	$ 17.81	5.82
Douglas	$ 16.98	5.27
Dump Truck		
Denver	$ 15.27	5.27
Douglas	$ 16.39	5.27
Lowboy Truck	$ 17.25	5.27
Mechanic	$ 26.48	3.50
Multi-Purpose Specialty & Hoisting Truck		
Denver	$ 17.49	3.17
Douglas	$ 20.05	2.88
Pickup and Pilot Car		
Denver	$ 14.24	3.77
Douglas	$ 16.43	3.68
Semi/Trailer Truck	$ 18.39	4.13
Truck Mounted Attenuator	$ 12.43	3.22
Water Truck		
Denver	$ 26.27	5.27
Douglas	$ 19.46	2.58

WELDERS - Receive rate prescribed for craft performing operation to which welding is incidental.

Office of Human Resources
Supplemental rates
(Specific to the Denver Projects)
Revised 4/11/2017)

Classification		Base	Fringe
Millwrights		$28.00	$10.00
Line Construction:			
	Lineman, Gas Fitter/Welder	$36.88	$9.55
	Line Eq Operator/Line Truck Crew	$25.74	$8.09
Power Equipment Operators (Tunnels Above and Below Ground, shafts and raises):			
	GROUP 1	$25.12	$10.81
	GROUP 2	$25.47	$10.85
	GROUP 3	$25.57	$10.86
	GROUP 4	$25.82	$10.88
	GROUP 5	$25.97	$10.90
	GROUP 6	$26.12	$10.91
	GROUP 7	$26.37	$10.94
Power Equipment Operators:			
	GROUP 1	$22.97	$10.60
	GROUP 2	$23.32	$10.63
	GROUP 3	$23.67	$10.67
	GROUP 4	$23.82	$10.68
	GROUP 5	$23.97	$10.70
	GROUP 6	$24.12	$10.71
	GROUP 7	$24.88	$10.79
Ironworkers (Ornamental)		$26.05	$12.00
Laborers (Removal of Asbestos)		$21.03	$8.55
Plumbers		$30.19	$13.55
Pipefitters		$30.45	$12.85
Truck Drivers:			
	GROUP 1	$18.42	$10.00
	GROUP 2	$19.14	$10.07
	GROUP 3	$19.48	$10.11
	GROUP 4	$20.01	$10.16
	GROUP 5	$20.66	$10.23
	GROUP 6	$21.46	$10.31

POWER EQUIPMENT OPERATOR CLASSIFICATIONS (TUNNELS ABOVE AND BELOW GROUND, SHAFTS, AND RAISES):

GROUP 1 - Brakeman

GROUP 2 - Motorman

GROUP 3 - Compressor

GROUP 4 - Air Tractors; Grout Machine; Gunnite Machine; Jumbo Form

GROUP 5 - Concrete Placement Pumps; Mucking Machines and Front End Loaders, Underground, Slusher; Mine Hoist Operator; Mechanic

GROUP 6 - Mechanic Welder

GROUP 7 - Mole

NOTE: Any equipment listed below being used in tunnel work, below or above ground shall be paid not less than $2.00 per hour above the listed wage rates.

POWER EQUIPMENT OPERATOR CLASSIFICATIONS:

GROUP 1 - Air compressor, brakeman, drill operator -smaller than Watson 2500 and similar, operators of 5 or more light plants, welding machines, generators, single unit conveyor, pumps, vacuum well point system, tractor, under 70 hp with or without attachments compressors, 360 C.F.M. or less

GROUP 2 - Conveyor, handling building materials, ditch witch and similar trenching machine, forklift, haulage motor man, pugmill, portable screening plant with or without a spray bar, screening plants, with classifier, self-propelled roller, rubber-tires under 5 tons.

GROUP 3 - asphalt plant, backfiller; cableway signalman; C.M.I. and similar, concrete batching plants, concrete finish machine, concrete gang saw on concrete paving, concrete mixer, less than 1 yd., under 8 inches, distributors, bituminous surfaces dozer, drill, diamond or core, elevating graders, elevator operator, lubricating and service engineer, grout machine, gunnite machine, hoist, 1 drum, horizontal directional drill operator, hydraulic backhoes; road stabilization machine, sandblasting Machine, single unit portable crusher, with or without washer, Tie tamper, wheel mounted, trenching machine operator, winch on truck.

GROUP 4 - Cable operated power shovels, draglines, articulated truck operator, clamshells, 5 cubic yards and under, concrete mixer over 1 Cubic yard, concrete pavers 34E or similar, grade Checker, hoist, 2 drums, mechanic, mixer mobile, Portable crusher, with or without washer; tractor with sideboom, roto-M ill and similar, welder.

GROUP 5 - Cable operated power shovels, draglines, clamshells and Backhoes over 5 cubic yards, caisson drill Watson 2500 similar or larger, motor grader blade-finish, hoist 3 drum or more.

GROUP 6 - Cableway, derrick, quad nine push unit, wheel excavator, belt or elevating loader.

GROUP 7 - tower cranes all types.

TRUCK DRIVER CLASSIFICATIONS:

GROUP 1 - Greasemen, Servicemen and Ambulance Drivers, Battery Men, Shuttle Truck or Bus, Flat Rack Tandem Axle.

GROUP 2 - Fork Lift Driver, Straddle Truck Driver, Lumber Carrier, Liquid and Bulk Tankers Single Axle, Combination, Euclid Electric or Similar, Specialty and Hoisting, Truck Drivers Fuel Truck, Grease Truck, Combination Fuel and Grease.

GROUP 3 - Truck Driver Snow Plow, Truck Driver Dump or Type Jumbo and similar type equipment.

GROUP 4 - Cement Mixer Agitator Truck over 10 cubic yards to and including 15 cubic yards, Tire Man, Cab Operated Distributor Truck Driver.

GROUP 5 - Heavy Duty Diesel Mechanic, Body Man, Welders or Combination Men.

WELDERS - Receive rate prescribed for craft performing operation to which welding is incidental.

DENVER
THE MILE HIGH CITY

TO: All Users of the City of Denver Prevailing Wage Schedules

FROM: Susan Keller, OHR Compensation and Classification

DATE: December 8, 2017

SUBJECT: Latest Update to Prevailing Wage Schedules

Please find an attachment to this memorandum of all the current Office of Human Resources Prevailing Wage Schedules issued in accordance with the City and County of Denver's Revised Municipal Code, Section 20-76(c). This schedule does not include the Davis-Bacon rates. The Davis-Bacon wage rates will continue to be published separately as they are announced.

Modification No. 135
Publication Date: December 8, 2017
(11 pages)

Unless otherwise specified in this document, apprentices shall be permitted only if they are employed pursuant to, and individually registered in, a bona fide apprenticeship program registered with the U.S. Department of Labor. The employer and the individual apprentice must be registered in a program, which has received prior approval, by the U.S. Department of Labor. Any employer, who employs an apprentice and is found to be in violation of this provision, shall be required to pay said apprentice the full journeyman scale.

Attachments as listed above.

APPLIANCE MECHANIC

Effective: 04-06-2017
Last Revision: 02-19-2009

Classification:	Base Wage	Fringes
Appliance Mechanic	$22.34/hour	$6.85/hour

Plus 10% shift differential for regularly scheduled hours worked between 6:00 p.m. and 6:00 a.m.

The Appliance Mechanic installs, services and repairs stoves, refrigerators, dishwashing machines, exercise equipment and other electrical household or commercial appliances, using hand tools, test equipment and following wiring diagrams and manufacturer's specifications. Responsibilities include: connects appliance to power source and test meters, such as wattmeter, ammeter, or voltmeter, observes readings on meters and graphic recorders, examines appliance during operating cycle to detect excess vibration, overheating, fluid leaks and loose parts, and disassembles appliances and examines mechanical and electrical parts. Additional duties include: traces electrical circuits, following diagram and locates shorts and grounds, using ohmmeter, calibrates timers, thermostats and adjusts contact points, and cleans and washes parts, using wire brush, buffer, and solvent to remove carbon, grease and dust. Replaces worn or defective parts, such as switches, pumps, bearings, transmissions, belts, gears, blowers and defective wiring, repairs and adjusts appliance motors, reassembles appliance, adjusts pulleys and lubricates moving parts, using hand tools and lubricating equipment.

Note: This position does not perform installations done at new construction.

BAGGAGE HANDLING SYSTEM MAINTENANCE

Effective: 10-19-2017
Last Revision: 9-15-2016

Classification:	Base Wage	Fringes
Entry-Support Mechanic	$22.32/hour	$6.99/hour
Machinery Maintenance Mechanic	$25.68/hour	$7.37/hour
Controls System Technician	$30.12/hour	$7.89/hour

Plus 10% shift differential for regularly scheduled hours worked between 6:00 p.m. and 6:00 a.m.

Entry Support Mechanic
The Entry Support Mechanic (ESM) applies basic mechanical knowledge to perform maintenance and operational tasks on an automated baggage handling system (BHS). Under supervision of a Machinery Maintenance Mechanic (MMM) or Control Systems Technician (CRO) The ESM performs cleaning, routine inspections, preventive, corrective, and emergency maintenance based on an established maintenance program. The MMM clears baggage jams and faults in the BHS and may physically move baggage during failures.

Machinery Maintenance Mechanic
The Machinery Maintenance Mechanic (MMM) applies advanced mechanical knowledge to perform maintenance and operational tasks on an automated baggage handling system (BHS). Performs cleaning of all parts of the BHS, routine inspections, preventive maintenance, corrective maintenance, and emergency maintenance within the BHS based on an established maintenance program. The MMM shall inspect all BHS equipment for proper operation and performance including but not limited to conveyors, lifts, diverters and automatic tag readers. The MMM troubleshoots, repairs, replaces, and rebuilds conveyor components including but not limited to; motors, gearboxes, bearings, rollers, sheaves, hydraulic systems, conveyor belting, clutch brakes, tools, independent carrier systems, and other complex devices using basic hand tools, power tools, welders and specialized tools. The MMM may assist the Control Systems Technician

(CST) with clearing electrical faults and electrical repairs. The MMM reads and interprets manufacturers' maintenance manuals, service bulletins, technical data, engineering data, and other specifications to determine feasibility and method of repairing or replacing malfunctioning or damaged components. The MMM clears baggage jams and faults in the BHS and may physically move baggage during failures. The MMM will operate a Central Monitoring Facility/Control Room, these duties include; using multiple computer systems for monitoring the BHS and running reports, communicating faults in the BHS using a radio and telephone, and communicating with Airport Personnel, Consultants, Transportation Security Administration, and Airline personnel. The MMM performs on-site training of ESM.

Controls System Technician
The Control Systems Technician (CST) applies advanced technical knowledge to perform maintenance and operational tasks on an automated baggage handling system (BHS). Performs all duties assigned to an MMM in addition to the following routine inspections, preventive maintenance, corrective maintenance, and emergency maintenance of complex components within the BHS based on an established maintenance program. The CST is responsible for resolving difficult controls, electrical and mechanical problems. The CST troubleshoots, repairs, replaces, and rebuilds complex electro-mechanical systems and conveyor components including but not limited to; programmable logic controllers, input and output modules, electrical switches, variable frequency drives, 110V AC and 24V DC controls devices, automatic tag readers, electrical control panels, 110V - 480V AC components and motors, gearboxes, bearings, rollers, sheaves, hydraulic systems, conveyor belting, clutch brakes, tools, independent carrier systems, and other complex devices using basic hand tools, power tools, welders and specialized mechanical and electrical tools. The CST reads and interprets manufacturers' maintenance manuals, service bulletins, technical data, engineering data, and other specifications to determine feasibility and method of repairing or replacing malfunctioning or damaged components. The CST clears mechanical, electrical and controls faults, baggage jams and may physically move baggage during failures. The CST performs on-site training and competency evaluations of MMM and ESM.

Note: Incumbents must posses an Electrician's license when work warrants.

BUILDING ENGINEER

Effective: 08-18-2016
Last Revision: August of 2015

Classification:	**Base Wage**	**Fringes**
Building Engineer	$28.20/hour	$7.52/hour

This classification of work is responsible for operating, monitoring, maintaining/repairing the facilities mechanical systems to ensure peak performance of the systems. This includes performing P.M. and repair work of the building mechanical systems, inspecting, adjusting, and monitoring the building automation and life safety systems, contacting vendors and place order replacement parts, responding to customer service requests and performing maintenance/repairs I tenant or public spaces, performing routine P.M. i.e. light plumbing and electrical repairs, ballast lamp and tube replacement, operating mechanical systems both on site and via a remote laptop computer, maintaining inventory of spare parts and tools, painting and cleaning mechanical equipment and machine rooms, etc.

CUSTODIANS

Effective: 12-1-2016
Last Revision: 12-3-2015

	Base Wage	Fringes
Custodian I		
	$14.53	$5.27 (Single) $7.33 (2-party) $9.29 (Family)
Custodian II		
	$14.88	$5.31 (Single) $7.37 (2-party) $9.33 (Family)

Benefits and Overtime

Parking	With valid receipt from approved parking lot, employees are reimbursed the actual monthly cost of parking.
RTD Bus Pass	Employer will provide employees with the Bus Pass or pay ($0.23) per hour for travel differential.
Shift Differential	2nd shift (2:30 p.m.-10:30 p.m.): $.50/hr 3rd shift (10:31 p.m.-6:30 a.m.): $1.00/hr.
Overtime	Time worked in excess of seven and one-half (7 ½) hours in one (1) day or in excess of thirty-seven and one-half (37 ½) hours in one week shall constitute overtime and shall be paid for at the rate of time and one-half (1 ½) at the employee's basic straight time hourly rate of pay.
Lunch	Any employee working seven and a half (7.5) hours in a day is entitled to a thirty (30) minute paid lunch.
Note	The Career Service Board in their public hearing on March 15, 2007 approved to amend prevailing wages paid to the Custodian as follows: "All contractors shall provide fringe benefits or cash equivalent at not less than the single rate amount. Contractors who offer health insurance shall provide an employer contribution to such insurance of not less than the 2-party or family rate for any employee who elects 2-party or family coverage. Contractors who offer such coverage will be reimbursed for their employer contributions at the above rates under any City contract incorporating this wage specification."

Position Descriptions:

Custodian I	Any employee performing general clean-up duties using equipment that does not require special training: i.e., dust mopping, damp mopping, vacuuming, emptying trash, spray cleaning, washing toilets, sinks, walls, cleaning chairs, etc.
Custodian II	Any employee performing specialized cleaning duties requiring technical training and the use of heavy and technical equipment, i.e., heavy machine operators floor strippers and waxers, carpet shampooers, spray buffing, re-lamping, mopping behind machines, high ladder work, chemical stripping and finishing of stainless steel.

DIA OIL & GAS WAGES

Effective: April 2017 (the following rates have not changed for 2017)
Last Revision: 3-17-2016

Classification:	Base Wage	Fringes
Mechanic	**$23.73**	**$7.01**
Electrician	**$24.90**	**$7.14**
Pipefitter	**$24.65**	**$7.11**
Rig/Drill Operator	**$21.87**	**$6.79**
Derrick Hand/Roustabout	**$13.87**	**$5.87**
Truck Driver	**$21.63**	**$6.77**

Service Contract Act Wage Determination No. 2015-5419 Rev No. 2 was used to obtain the base wages and fringe benefits.

HEAVY EQUIPMENT MECHANIC
The Heavy Equipment Mechanic analyzes malfunctions and repairs, rebuilds and maintains power equipment, such as cranes, power shovels, scrapers, paving machines, motor graders, trench-digging machines, conveyors, bulldozers, dredges, pumps, compressors and pneumatic tools. This worker operates and inspects machines or equipment to diagnose defects, dismantles and reassembles equipment, using hoists and hand tools, examines parts for damage or excessive wear, using micrometers and gauges, replaces defective engines and subassemblies, such as transmissions, and tests overhauled equipment to insure operating efficiency. The mechanic welds broken parts and structural members, may direct workers engaged in cleaning parts and assisting with assembly and disassembly of equipment, and may repair, adjust and maintain mining machinery, such as stripping and loading shovels, drilling and cutting machines, and continuous mining machines.

PIPEFITTER, MAINTENANCE
The Pipefitter, Maintenance installs or repairs water, steam, gas or other types of pipe and pipefitting. Work involves most of the following: laying out work and measuring to locate position of pipe from drawings or other written specifications, cutting various sizes of pipe to correct lengths with chisel and hammer, oxyacetylene torch or pipe-cutting machines, threading pipe with stocks and dies. This person is responsible for bending pipe by hand-driven or power-driven machines, assembling pipe with couplings and fastening pipe to hangers, making standard shop computations relating to pressures, flow and size of pipe required; and making standard tests to determine whether finished pipes meet specifications. In general, the work of the Maintenance Pipefitter requires rounded training and experience usually acquired through a formal apprenticeship or equivalent training and experience.

WELL DRILLER
This incumbent sets up and operates portable drilling rig (machine and related equipment) to drill wells, extends stabilizing jackscrews to support and level drilling rig, moves levers to control power-driven winch that raises and extends telescoping mast. This person bolts trusses and guy wires to raise mast and anchors them to machine frame and stakes, and assembles drilling tools, using hand tools or power tools. The Well Driller moves levers and pedals to raise tools into vertical drilling position and lowers well casing (pipe that shores up walls of well) into well bore, using winch, moves levers and pedals and turns hand wells to control reciprocating action of machine and to drive or extract well casing.

LABORER
The Laborer performs tasks that require mainly physical abilities and effort involving little or no specialized skill or prior work experience. The following tasks are typical of this occupation: The Laborer loads and unloads trucks, and other conveyances, moves supplies and materials to proper location by wheelbarrow or hand truck; stacks materials for storage or binning, collects refuse and salvageable materials, and digs, fills, and tamps earth excavations, The Laborer levels ground using pick, shovel, tamper and rake, shovels concrete and snow; cleans culverts and ditches, cuts tree and brush; operates power lawnmowers, moves and arranges heavy pieces of office and household furniture, equipment, and appliance, moves heavy pieces of automotive, medical engineering, and other types of machinery and equipment, spreads sand and salt on icy roads and walkways, and picks up leaves and trash.

TRUCKDRIVER, HEAVY TRUCK
Straight truck, over 4 tons, usually 10 wheels. The Truckdriver drives a truck to transport materials, merchandise, equipment, or workers between various types of establishments such as: manufacturing plants, freight depots, warehouses, wholesale and retail establishments, or between retail establishments and customers' houses or places of business. This driver may also load or unload truck with or without helpers, make minor mechanical repairs, and keep truck in good working order.

ELEVATOR REPAIRER

Effective: 12-01-16
Last Revision: 12-18-2015

Classification:	Base Wage	Fringes
Elevator Mechanic/Repairer	$42.35/hour	$35.72/hour (< 5 yrs. service) $36.58/hour (> 5 yrs. service)

Elevator Repairer: The SCA-Directory of Occupations describes, Elevator Repairer as, "repairs and maintains "Automated People Movers" and like named devices used in the transportation of people and materials including, but not limited to elevators, escalators, dumbwaiters, and moving walkways to meet safety regulations and building codes. This worker trouble shoots and determines causes of trouble in brakes, electrical motors, switches, signal and control systems, using computers, test lamps, voltmeters, ammeters, and oscilloscopes, disassembles defective units and repairs or replaces parts such as electrical door locks, cables, electrical wiring and faulty safety devices installs push button control systems, complete control systems, and other devices to modernize automated people mover systems, and cleans and lubricates bearing and other parts to minimize friction."

FINISHER & JOURNEYMAN (TILE, MARBLE AND TERRAZZO)

Effective: 9-7-2017
Last Revision: 7-21-2016

Classification:	Base Wage	Fringes
Finisher (Tile-Marble-Terrazzo)	$21.38/hr	$8.86/hr
Journeyman (Tile, Marble, Terrazzo	$27.33/hr	$8.92/hr

Effective May 1, 2008, Local Union 7 of Colorado combined three classes of Finishers, Floor Grinders, and Base Grinders into Finisher using one pay schedule.

Tile Setter: Applies to workers who apply tile to floors, walls, ceilings, stair treads, promenade roof decks, garden walks, swimming pools and all places where tiles may be used to form a finished surface for practical use, sanitary finish or decorative purpose.

FIRE EXTINGUISHER REPAIRER

Effective Date: 10-19-2017
Last Revision: 08-18-2016

Classification:	Base Wages:	Fringes:
Fire Extinguisher Repairer	$19.57/hr	$6.67

The Fire Extinguisher Repairer performs the following duties: repairs and tests fire extinguishers in repair shops and in establishments, such as factories, homes, garages, and office buildings, using hand tools and hydrostatic test equipment, this repairer dismantles extinguisher and examines tubings, horns, head gaskets, cutter disks, and other parts for defects, and replaces worn or damaged parts. Using hand tools, this repairer cleans extinguishers and recharges them with materials, (such as soda water and sulfuric acid, carbon tetrachloride, nitrogen or patented solutions); tests extinguishers for conformity with legal specifications using hydrostatic test equipment, and may install cabinets and brackets to hold extinguishers.

FUEL HANDLER SERIES

Effective: 10-20-2016
Last Revision: 10-22-2015

Classification:	**Base Wage**	**Fringes**
Fuel Distribution System Operator	$20.87/hour	$6.68/hour
Lead Fuel Distribution System Operator	$21.82/hour	$6.79/hour
Fuel Distribution System Mechanic	$25.81/hour	$7.25/hour
Lead Fuel Distribution System Mechanic	$26.98/hour	$7.38/hour

Plus 10% shift differential for hours worked between 6:00 p.m. and 6:00 a.m.

Fuel Distribution System Operator:

Receives, stores, transfers, and issues fuel. Performs various testing procedures and documentation on fuel samples. Gauges tanks for water, temperature and fuel levels. Performs temperature and gravity testing for correct weight of fuel. Checks pumping systems for correct operating pressure or unusual noises. Inspects fuel receiving, storage, and distribution facilities to detect leakage, corrosion, faulty fittings, and malfunction of mechanical units, meters, and gauges such as distribution lines, float gauges, piping valves, pumps, and roof sumps. Operates a 24-hour control center; operates various computer equipments to determine potential equipment failure, leak and cathodic protection systems, pump failure, and emergency fuel shutoff systems. Monitors quality of fuel and drains excess condensation from fuel sumps and underground fuel pits. Inspects fuel tank farm for such items as leaks, low pressure, and unauthorized personnel. Performs general housekeeping and grounds maintenance for terminal, pipeline and dock areas, including fuel pits and valve vault cleaning and pump out activities. May connect lines, grounding wires, and loading and off-loading arms of hoses to pipelines. May assist Fuel Distribution System Mechanics by preparing work areas. Maintains record of inspections, observations and test results.

Lead Fuel Distribution System Operator:

Performs lead duties such as making and approving work assignments and conducting on-the-job training as well as performing the various tasks performed by the Operator classification.

Fuel Distribution System Mechanic:

Maintains and repairs fuel storage and distribution systems, equipment and filtration systems, and differential pressure valves. Corrects leakage, corrosion, faulty fittings, and malfunction of mechanical units, meters, and gauges such as distribution lines, float gauges, piping valves, pumps, and roof sumps.

Inspects electrical wiring, switches, and controls for safe-operating condition, grounding, and adjustment; may make minor repairs. Lubricates and repacks valves. Lubricates pumps, replaces gaskets, and corrects pumping equipment misalignment. May clean strainers and filters, service water separators, and check meters for correct delivery and calibration. Overhauls system components such as pressure regulating valves and excess valves. Disassembles, adjusts, aligns, and calibrates gauges and meters or replaces them. Removes and installs equipment such as filters and piping to modify system or repair and replace system component. Cleans fuel tanks and distribution lines. Removes corrosion and repaints surfaces. Overhauls vacuum and pressure vents, floating roof seals, hangers, and roof sumps. Some positions maintain fuel-servicing equipment such as hydrant and tanker trucks. Maintains record of inspections and repairs and other related paperwork as required.

Lead Fuel Distribution System Mechanic:

Performs lead duties such as making and approving work assignments and conducting on-the-job training as well as performing the various tasks performed by the Mechanic classification.

These classifications are recommended to be inclusive and to supersede any previously adopted classifications.

FURNITURE MOVERS

(Moving, Storage and Cartage Workers)

Effective: 10-20-2016
Last Revision: 10-22-2015

Classification:	Base Wage	Fringes
Laborer/Helper	$17.36/hour	$6.27/hour
Driver/Packer	$17.43/hour	$6.28/hour
Lead Worker	$18.22/hour	$6.37/hour

GLYCOL FACILITY WAGES

Effective: 7-21-2016
Last Revision: 7-2-2015

Classification:	SCA Title	Base Wage	Fringes	Total
Deicing Facility Operator	Water Treatment Plant Operator	**$$25.07**	**$7.16**	**$32.23**
Maintenance Mechanic	Machinery Maintenance Mechanic	**$25.59**	**$7.22**	**$32.81**
Material Handling Laborer	Material Handling Laborer	**$17.36**	**$6.27**	**$23.63**

DEICING FACILITY OPERATOR
The De-Icing Facility Operator is responsible for the safe and efficient daily operation of all Aircraft De-icing Fluid Equipment to include: mechanical vapor recompression (concentrators), distillation, polishing, distribution, and collection systems as well as daily routine chores to include: operating and controlling all facility machines and equipment associates with the Aircraft De-icing Fluid System (ADS). Operate electrical motors, pumps and valves to regulate flow, add specific amounts of chemicals such as Hydrochloric Acid or Sodium Hydroxide to fluid(s) for adjustment as required, turn valves, change filters/activated carbon, and clean tanks as needed to optimize productivity. Monitor panel boards/HMI/PLC's, adjust control flow rates, repairs, and lubricate machinery and equipment using hand powered tools. Test fluids to determine quality controlling methods. Record data as necessary and maintain good housekeeping of the facility.

MAINTENANCE MECHANIC
The position of the Machinery Maintenance Mechanic will be primarily responsible for the routine maintenance and repairs of all facility equipment. Responsible for repairs to machinery and mechanical

equipment, examine machines and mechanic equipment to diagnose source of trouble, dismantling or partly dismantling machines and performing repairs that mainly involve the use of hand tools in scraping and fitting parts, replacing broken or defective parts with items obtained from stock, ordering replacement parts, sending parts to a machine shop or equivalent for major repairs, preparing specific written specifications for repairs, SOP's for minor repairs, reassembly of machines and mechanical equipment, and making any necessary adjustments to all equipment for operational optimization.

MATERIAL HANDLING LABORER
The Material Handling Laborer is responsible for the safe and efficient daily documentation/recording of all ADF processors, distillation and polishing systems, as well as the distribution and collection system. Performing physical tasks to transport and/or store materials or fluids. Duties involve one or more of the following: manually loading or unloading trucks, tankers, tanks, totes, drums, pallets, unpacking, placing items on storage bins or proper locations. Utilizing hand carts, forklift, or wheelbarrow. Completing daily fluid inventory, to include tank measuring and completing fluid accountability records. Responsible for the overall facility housekeeping and general cleanliness. Escort vehicles and tankers in and out of the facility, change out filters as required on all systems, take samples and test for quality control and document the findings.

PARKING ELECTRONICS TECHNICIAN

Effective: 12-7-2017
Last Revision: 10-20-2016

Classification:	**Base Wage**	**Fringes**
Parking Electronics Technician	$24.35/hour	$7.22/hour

Plus 10% shift differential for regularly scheduled hours worked between 6:00 p.m. and 6:00 a.m.

This classification of work installs, modifies, troubleshoots, repairs and maintains revenue control equipment at manned and unmanned parking entrance and exit gates. Replaces consumable items such as tickets, printer ribbons, and light bulbs. Replaces modules and related equipment as needed to repair existing equipment, modify applications, or resolve unusual problems. Troubleshoots, tests, diagnoses, calibrates, and performs field repairs. Performs preventive maintenance such as inspection, testing, cleaning, lubricating, adjusting and replacing of serviceable parts to prevent equipment failure for electromechanical control in order to minimize repair problems and meet manufacturers' specifications.

PEST CONTROLLER

Effective Date: 10-19-2017
Last Revision: 8-8-2016

Classification:	**Base Wage**	**Fringes**
Pest Controller	$20.41/hour	$6.77 /hour

The Pest Controller sprays chemical solutions or toxic gases and sets mechanical traps to kill pests that infest buildings and surrounding areas, fumigates rooms and buildings using toxic gases, sprays chemical solutions or dusts powders in rooms and work areas, places poisonous paste or bait and mechanical traps where pests are present; may clean areas that harbor pests, using rakes, brooms, shovels, and mops preparatory to fumigating; and may be required to hold State license

QUALITY CONTROL & ASSURANCE TECHNICIAN

Effective Date: 03/02/2017
Last Revision: This is a new class so there is no prior revision date.

Classification:	**Base Wage**	**Fringes**
Quality Control & Assurance Technician	$21.37/hour	$6.74 /hour

The Quality Control & Assurance Technician provides support to Inland Technologies operations by independently performing standard analysis on samples related to the manufacture of spent de-icing fluid to a 99% recycled glycol product and waste water discharge. The Quality Control and Assurance Technician will continually look at ways to improve products and processes to exceed customer quality demands and decrease operational costs.

SIGN ERECTOR

Effective: 10-15-2010
Last Revision: 10-15-2009

Classification:	**Base Wage**	**Fringes**
Sign Erector	$20.19/hour	$3.80/hour

This classification of work erects, assembles, and/or maintains signs, sign structures and/or billboards using various tools. Erects pre-assembled illuminated signs on buildings or other structures according to sketches, drawings, or blueprints. Digs and fills holes, places poles. Bolts, screws. or nails sign panels to sign post or frame. Replaces or repairs damaged or worn signs. May use welding equipment when installing sign. This classification is not a licensed electrician and therefore cannot make connections to power sources (i.e., provide exit lighting).

TRANSIT TECHNICIANS

Effective: 12-01-16
Last Revision: 12-18-2015

Classification:	**Base Wage**	**Fringes**
Transit Technician - Entry	$24.34/hour	$7.08/hour
Transit Technician - Senior	$26.61/hour	$7.34/hour
Transit Technician - Lead	$27.82/hour	$7.48/hour

In addition, shift differentials of eight percent (8%) of the employee's straight time pay rate for the second shift and ten percent (10%) for the third shift for straight time work regularly scheduled providing lore that (50%) of the employee's work occurred on such shift.

Transit Technician-Entry: Associates in this position will be given instruction by on-the-job and/or classroom training to perform corrective and preventive maintenance, inspections, repairs, and adjustments to all systems, subsystems, and components of an electronic, mechanical, electro/mechanical, hydraulic, and pneumatic nature. This classification of workers may assist with routine preventive maintenance, inspection, and adjustment. Tasks and procedures are well established and require close supervision. Incumbents will follow the direction of higher level personnel in preventive or corrective maintenance phases of work. Most tasks will be of an apprentice nature and will require close supervision. Incumbents will progress to the journey level after one year as a Transit Technician-Entry.

Transit Technician-Senior: This is a full performance level class performing various corrective and

preventive maintenance, inspections, repairs, and adjustments to all systems, subsystems, and components of an electronic, mechanical, electro-mechanical, hydraulic, and pneumatic nature; monitors the transit system via a central computer system to make automated adjustments in the operation and maintenance of the transit system.

Transit Technician-Lead: Performs lead technical duties such as making work assignments and conducting on-the-job informal training as well as performing various tasks involved with the operation and maintenance of the transit system. The Lead Transit Technician is the specialist in terms of hands-on diagnosis and troubleshooting various problems that may arise on the transit system.

TREE TRIMMERS

Effective: 10-19-2017
Last Revision: 10-15-2010

Classification:	Base Wage	Fringes
Tree Trimmer	$19.39/hour	$6.65/hour

This classification of work trims, removes, and applies insecticides to trees and shrubbery including trimming dead, diseased, or broken limbs from trees utilizing rope and saddle, chain, handsaw and other related equipment common to the care of trees and shrubs. Removes limbs, branches and other litter from the work area, observes safety rules, inspects and identifies tree diseases and insects of the area distinguishing beneficial insects and environmental stress, takes samples form diseased or insect infested trees for lab analysis, operates a wide variety of heavy and power equipment in trimming and removing trees and shrubbery i.e. mobile aerial tower unit, tandem trucks, loaders, chipper, etc., maintains all equipments.

WINDOW CLEANERS

Effective: 12-01-2016
Last Revision: 2-18-2016

Classification:	Base Wage	Fringes
Window Cleaner	$24.79/hour	$8.39/hr (Single) $10.47/hr (2-Party) $12.46/hr (Family)

Benefits/Overtime

Parking	With valid monthly parking receipt from approved parking lot, employees are reimbursed for the cost of parking. The employer shall reimburse employees for parking expenses from other parking lots up to the amount reimbursed for DIA Employee Parking Lot upon the submission of a monthly parking receipt. Only (1) one receipt per month.
Shift Differential	$0.75 per hour for employees assigned to 3rd shift (11:00 p.m. to 7:00 a.m.)
Overtime	One and one-half (1½) times the basic rate of pay in excess of 7.5 hours worked per day or 37.5 hours worked per week.

Lunch	Any employee working seven and a half (7.5) hours in a day is entitled to a thirty (30) minute paid lunch.
Lead Work	$1.25 per hour above highest paid employee under supervision
High Work	$1.75 per hour (21 feet or more from ground (base) to top of surface/structure being cleaned)
Training	$0.25 per hour
ECOPASS	The Company will provide an Eco-Pass to all bargaining unit employees or pay $.24 per hour for travel differential.
Note:	The Career Service Board in their public hearing on April 3, 2008, approved to amend prevailing wages paid to the Window Cleaners as follows: “All contractors shall provide fringe benefits or cash equivalent at not less than the single rate amount. Contractors who offer health insurance shall provide an employer contribution to such insurance of not less than the 2-party or family rate for any employee who elects 2-party or family coverage. Contractors who offer such coverage will be reimbursed for their employer contributions at the above rates under any City contract incorporating this wage specification.”

Exhibit R – Rules and Regulations Regarding Equal Opportunity

CITY AND COUNTY OF DENVER

DEPARTMENT OF PUBLIC WORKS

APPENDIX A

CITY AND COUNTY OF DENVER EQUAL OPPORTUNITY CLAUSE - ALL CONTRACTS

1. The Contractor will not discriminate against any employee or applicant for employment because of race, creed, color, sex, age, national origin, religion, marital status, political opinion or affiliation, or mental or physical handicap. The Contractor will take affirmative action to ensure that applicants are employed, and that employees are treated during employment without regard to their race, creed, color, sex, age, national origin, religion, marital status, political opinion or affiliation, or mental or physical handicap. Such action shall include, but not be limited to the following: employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The Contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided setting forth the provisions of this nondiscrimination clause.

2. The Contractor will, in all solicitations or advertisements for employees placed by or on behalf of the contractor, state that all qualified applicants will receive consideration for employment without regard to race, creed, color, sex, age, national origin, religion, marital status, political opinion or affiliation, or mental or physical handicap.

3. The Contractor will send to each labor union or representative of workers with which he has a collective bargaining agreement or other contract or understanding, a notice to be provided, advising the said labor union or workers' representatives of the contractor's commitments under this section, and shall post copies of the notice in conspicuous places available to employees and applicants for employment.

4. Each Contractor will comply with all provisions of Article III, Division 2 of Chapter 28 of the Revised Municipal Code, and the rules, regulations, and relevant orders of the Executive Director and the Director.

5. The Contractor will furnish all information and reports required by Article III, Division 2 of Chapter 28 of the Revised Municipal Code, and by rules, regulations and orders of the Executive Director and Director or pursuant thereto, and will permit access to his books, records, and accounts by the Executive Director, Director, or their designee for purposes of investigation to ascertain compliance with such rules, regulations, and orders.

6. In the event of the Contractor's noncompliance with the nondiscrimination clauses of this contract or with any of the said rules, regulations or orders, this contract may be canceled, terminated, or suspended in whole or in part and the Contractor may be declared ineligible for further City contracts in accordance with procedures authorized in Article III, Division 2, Chapter 28 of the Revised Municipal Code, or by rules, regulations, or order of the Executive Director.

7. The Contractor will include Regulation 12, Paragraph 2 and the provisions of paragraphs (1) through (6) in every subcontract of purchase order unless exempted by rules, regulations, or orders of the Executive Director issued pursuant to Article III, Division 2, Chapter 28 of the Revised Municipal Code, so that such provisions will be binding on each subcontractor or supplier. The Contractor will take such action with respect to any subcontract or purchase order as the administering agency may direct as a means of enforcing such provisions, including sanctions for noncompliance.

The applicant further agrees to be bound by the above equal opportunity clauses with respect to its own employment practices when it participates in City contracts. The Contractor agrees to assist and cooperate actively with the Executive Director and the Director in obtaining compliance of subcontractors and suppliers with the equal opportunity clause and the rules, regulations and relevant orders of the Executive Director, and will furnish the Executive Director and the Director such information as they may require for the supervision of compliance, and will otherwise assist the Executive Director and Director in the discharge of the City's primary responsibility for securing compliance. The Contractor further agrees to refrain from entering into any contract or contract modification subject to Article III, Division 2 of Chapter 28 of the Revised Municipal Code with a contractor debarred from, or who has not demonstrated eligibility for, City contracts.

The Contractor will carry out such sanctions and penalties for violation of the equal opportunity clause as may be imposed upon contractors and subcontractors by the Executive Director and Director. In addition, the Contractor agrees that failure or refusal to comply with these undertakings the Executive Director may take any or all of the following actions:

A. Cancellation, termination, or suspension in whole or in part of this contract.

B. Refrain from extending any further assistance to the applicant under the program with respect to which the failure occurred until satisfactory assurance of future compliance has been received from such applicant.

C. Refer the case to the City Attorney for appropriate legal proceedings.

SUBCONTRACTS: Each prime Contractor or Subcontractor shall include the equal opportunity clause in each of its subcontracts.

CITY AND COUNTY OF DENVER
DEPARTMENT OF PUBLIC WORKS

APPENDIX F

AFFIRMATIVE ACTION REQUIREMENTS

EQUAL EMPLOYMENT OPPORTUNITY

For All Non-Exempt Construction Contracts to Be Awarded by the
City and County of Denver, Department of Public Works.

NOTICE

EACH BIDDER, CONTRACTOR OR SUBCONTRACTOR (HEREINAFTER THE CONTRACTOR) MUST FULLY COMPLY WITH THE REQUIREMENTS OF THESE BID CONDITIONS AS TO EACH CONSTRUCTION TRADE IT INTENDS TO USE ON THIS CONSTRUCTION CONTRACT, AND ALL OTHER CONSTRUCTION WORK (BOTH CITY AND NON-CITY) IN THE DENVER AREA DURING THE PERFORMANCE OF THIS CONTRACT OR SUBCONTRACT. THE CONTRACTOR COMMITS ITSELF TO THE GOALS FOR MINORITY MANPOWER UTILIZATION, AS APPLICABLE, AND ALL OTHER REQUIREMENTS, TERMS AND CONDITION OF THESE BID CONDITIONS BY SUBMITTING A PROPERLY SIGNED BID.

THE CONTRACTOR SHALL APPOINT A COMPANY EXECUTIVE TO ASSUME THE RESPONSIBILITY FOR THE IMPLEMENTATION OF THE REQUIREMENTS, TERMS AND CONDITIONS OF THESE BID CONDITIONS.

/s/

Executive Director of Public Works
City and County of Denver

A. REQUIREMENTS - AN AFFIRMATIVE ACTION PLAN:

Contractors shall be subject to the provisions and requirements of these bid conditions including the goals and timetables for minority* and female utilization, and specific affirmative action steps set forth by the Division of Small Business Opportunity (DSBO). The contractor's commitment to the goals for minority, and female utilization as required constitutes a commitment that it will make every good faith effort to meet such goals.

1. GOALS AND TIMETABLES:

The goals and timetables for minority and female participation, expressed in percentage terms for the contractor's aggregate workforce in each trade are as follows:

GOALS FOR MINORITY PARTICIPATION FOR EACH TRADE	GOALS FOR FEMALE PARTICIPATION FOR EACH TRADE
From January 1, 1982 to Until Further Notice	From January 1, 1982 to Until Further Notice
21.7% - 23.5%	**6.9%**

The goals for minority and female utilization above are expressed in terms of hours of training and employment as a proportion of the total number of hours to be worked by the contractor's aggregate workforce, which includes all supervisory personnel, in each trade, on all projects for the City and County of Denver during the performance of its contract (i.e., The period beginning with the first day of work on the City and County of Denver funded construction contract and ending with the last day of work).

The hours of minority and female employment and training must be substantially uniform throughout the length of the contract in each trade and minorities and females must be employed evenly on each of a contractor's projects. Therefore, the transfer of minority or female employees from contractor to contractor or from project to project for the purpose of meeting the contractor's goals shall be a violation of these Bid Conditions.

If the Contractor counts the nonworking hours of apprentices they must be employed by the Contractor during the training period; the Contractor must have made a commitment to employ apprentices at the completion of their training subject to the availability of employment opportunities; and the apprentices must be trained pursuant to training programs approved by the Bureau of Apprenticeship and Training.

* "Minority" is defined as including, Blacks, Spanish Surname Americans, Asian Americans, and American Indians, and includes both men and minority women.

2. SPECIFIC AFFIRMATIVE ACTION STEPS:

No contractor shall be found to be in noncompliance solely on account of its failure to meet its goals, but will be given an opportunity to demonstrate that the contractor has instituted all the specific affirmative action steps specified and has made every good faith effort to make these steps work toward the attainment of its goals within the timetables, all to the purpose of expanding minority and female utilization in its aggregate workforce. A contractor, who fails to comply with its obligation under the Equal Opportunity Clause of its contract and fails to achieve its commitments to the goals for minority and female utilization has the burden of proving that it has engaged in an Affirmative Action Program directed at increasing minority and female utilization and that such efforts were at least as extensive and as specific as the following:

a. The Contractor should have notified minority and female organizations when employment opportunities were available and should have maintained records of the organization's response.

b. The Contractor should have maintained a file of the names and addresses of each minority and female referred to it by any individual or organization and what action was taken with respect to each such referred individual, and if the individual was not employed by the Contractor, the reasons. If such individual was sent to the union hiring hall for referral and not referred back by the union or if referred, not employed by the Contractor, the file should have documented this and their reasons.

c. The Contractor should have promptly notified the Department of Public Works, and the Division of Small Business Opportunity when the union or unions with which the Contractor has collective bargaining agreements did not refer to the contractor a minority or female sent by the contractor, or when the Contractor has other information that the union referral process has impeded efforts to meet its goals.

d. The Contractor should have disseminated its EEO policy within its organization by including it in any employee handbook or policy manual; by publicizing it in company newspapers and annual reports and by advertising such policy at reasonable intervals in union publications. The EEO policy should be further disseminated by conducting staff meetings to explain and discuss the policy; by posting of the policy; and by review of the policy with minority and female employees.

e. The Contractor should have disseminated its EEO policy externally by informing and discussing it with all recruitment sources; by advertising in news media, specifically including minority and female news media; and by notifying and discussing it with all subcontractors.

f. The Contractor should have made both specific and reasonably recurrent written and oral recruitment efforts. Such efforts should have been directed at minority and female organizations, schools with substantial minority and female enrollment, and minority and female recruitment and training organizations within the Contractor's recruitment area.

g. The Contractor should have evidence available for inspection that all tests and other selection techniques used to select from among candidates for hire, transfer, promotion, training, or retention are being used in a manner that does not violate the OFCCP Testing Guidelines in 41 CFR Part 60-3.

h. The Contractor should have made sure that seniority practices and job classifications do not have a discriminatory effect.

i. The Contractor should have made certain that all facilities are not segregated by race.

j. The Contractor should have continually monitored all personnel activities to ensure that its EEO policy was being carried out including the evaluation of minority and female employees for promotional opportunities on a quarterly basis and the encouragement of such employees to seek those opportunities.

k. The Contractor should have solicited bids for subcontracts from available minority and female subcontractors engaged in the trades covered by these Bid Conditions, including circulation of minority and female contractor associations.

NOTE: The Director and the Division of Small Business Opportunity will provide technical assistance on questions pertaining to minority and female recruitment sources, minority and female community organizations, and minority and female news media upon receipt of a request for assistance from a contractor.

3. NON - DISCRIMINATION:

In no event may a contractor utilize the goals and affirmative action steps required in such a manner as to cause or result in discrimination against any person on account of race, color, religion, sex, marital status, national origin, age, mental or physical handicap, political opinion or affiliation.

4. COMPLIANCE AND ENFORCEMENT:

In all cases, the compliance of a contractor will be determined in accordance with its obligations under the terms of these Bid Conditions. All contractors performing or to perform work on projects subject to these Bid Conditions hereby agree to inform their subcontractors in writing of their respective obligations under the terms and requirements of these Bid Conditions, including the provisions relating to goals of minority and female employment and training.

B. CONTRACTORS SUBJECT TO THESE BID CONDITIONS:

In regard to these Bid Conditions, if the Contractor meets the goals set forth therein or can demonstrate that it has made every good faith effort to meet these goals, the Contractor shall be presumed to be in compliance with Article III, Division 2 of Chapter 28 of the Revised Municipal Code, the implementing regulations and its obligations under these Bid Conditions. In the event, no formal sanctions or proceedings leading toward sanctions shall be instituted unless the contracting or administering agency otherwise determines that the contractor is violating the Equal Opportunity Clause.

1. Where the Office of Contract Compliance finds that a contractor failed to comply with the requirements of Article III, Division 2 of Chapter 28 of the Revised Municipal Code or the

implementing regulations and the obligations under these Bid Conditions, and so informs the Executive Director, the Executive Director shall take such action and impose such sanctions, which include suspension, termination, cancellation, and debarment, as may be appropriate under the Ordinance and its regulations. When the Executive Director proceeds with such formal action it has the burden of proving that the Contractor has not met the goals contained in these Bid Conditions. The Contractor's failure to meet its goals shall shift to it the requirement to come forward with evidence to show that it has met the good faith requirements of these Bid Conditions.

2. The pendency of such proceedings shall be taken into consideration by the Department of Public Works in determining whether such contractor can comply with the requirements of Article III, Division 2 of Chapter 28 of the Revised Municipal Code, and is therefore a "responsible prospective contractor".

3. The Division of Small Business Opportunity shall review the Contractor's employment practices during the performance of the contract. If the Division of Small Business Opportunity determines that the Contractor's Affirmative Action Plan is no longer an acceptable program, the Director shall notify the Executive Director.

C. OBLIGATIONS APPLICABLE TO CONTRACTORS:

It shall be no excuse that the union with which the Contractor has a collective bargaining agreement providing for exclusive referral failed to refer minority or female employees. Discrimination in referral for employment, even if pursuant to provisions of a collective bargaining agreement, is prohibited by the National Labor Relations Act, as amended, Title VI of the Civil Rights Act of 1964, as amended, and Article III, Division 2 of Chapter 28 of the Revised Municipal Code. It is the policy of the Department of Public Works that contractors have a responsibility to provide equal employment opportunity, if they wish to participate in City and County of Denver contracts. To the extent they have delegated the responsibility for some of their employment practices to a labor organization and, as a result, are prevented from meeting their obligations pursuant to Article III, Division 2, Chapter 28 of the Revised Municipal Code, such Contractors cannot be considered to be in compliance with Article III, Division 2, Chapter 28 of the Revised Municipal Code, or its implementing rules and regulations.

D. GENERAL REQUIREMENTS:

Contractors are responsible for informing their subcontractors in writing regardless of tier, as to their respective obligations. Whenever a Contractor subcontracts a portion of work in any trade covered by these Bid Conditions, **it shall include these Bid Conditions in such subcontracts and each subcontractor shall be bound by these Bid Conditions to the full extent as if it were the prime contractor.** The Contractor shall not, however, be held accountable for the failure of its subcontractors to fulfill their obligations under these Bid Conditions. However, the prime contractor shall give notice to the Director of any refusal or failure of any subcontractor to fulfill the obligations under these Bid Conditions. A subcontractor's failure to comply will be treated in the same manner as such failure by a prime contractor.

1. Contractors hereby agree to refrain from entering into any contract or contract modification subject to Article III, Division 2, Chapter 28 of the Revised Municipal Code with a contractor debarred from, or who is determined not to be a "responsive" bidder for the City and County of Denver contracts pursuant to the Ordinance.

2. The Contractor shall carry out such sanctions and penalties for violation of these Bid Conditions and the Equal Opportunity Clause including suspension, termination and cancellation of existing subcontracts and debarment from future contracts as may be ordered by the Executive Director pursuant to Article III, Division 2, Chapter 28 of the Revised Municipal Code and its implementing regulations.

3. Nothing herein is intended to relieve any contractor during the term of its contract from compliance with Article III, Division 2, Chapter 28 of the Revised Municipal Code, and the Equal Opportunity Clause of its contract with respect to matters not covered in these Bid Conditions.

4. Contractors must keep such records and file such reports relating to the provisions of these Bid Conditions as shall be required by the Office of Contract Compliance.

5. Requests for exemptions from these Bid Conditions must be made in writing, with justification, to the Executive Director of Public Works, 201 W. Colfax, Dept. 608, Denver, Colorado 80202, and shall be forwarded through and with the endorsement of the Director

EXHIBIT S

General Contract Conditions (incorporated by reference, Index attached)

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Exhibit T – Contractor’s Workforce Plan

National Western Center (NWC) Horizontal Integrated Construction (HIC) Services - Workforce Plan (FINAL 5/15/18)

Work Component	Additional Description	Initial Measures (2018)	Ongoing
HIC Workforce Plan Management			
Desired outcome: Efficient and effective management of the HIC workforce program			
Assign full-time workforce coordinator	Assign full-time HIC workforce coordinator to manage program and to ensure all contract requirements are met. Position will be supported by oversight by the embedded NWCO workforce manager.	Develop detailed job description for approval by the Mayor's Office of the National Western Center (NWCO).	Update assigned tasks annually. Annual performance review against tasks by NWCO.
Workforce plan integration and oversight	Ensure that all subcontractor efforts, including outreach, training and data collection, are coordinated with overall program efforts and metrics.	Develop program for task and data coordination for approval by NWCO.	Review and update program quarterly
Ongoing Coordination with WORKNOW	Assess opportunities to create efficiencies by utilizing the WORKNOW platform and partners, across all contract tasks.	Develop program for ongoing WORKNOW coordination for approval by NWCO.	Review and update program quarterly
Outreach and Engagement (multi-lingual)			
Desired Outcome: Help individuals build awareness of the variety of careers available and provide experiences that build strong career pipelines.			
Develop detailed communications and outreach strategy	Including media campaign and high-profile presence at large-scale community events and in Targeted Areas.	Develop strategy for approval by NWCO.	Review and update quarterly
Conduct or participate in job fairs and outreach event engagements	No less than one job fair per quarter in Targeted Areas and with each Targeted Population without exemption by NWCO.	Develop strategy for approval by NWCO.	Review and update quarterly
Connect with local schools and organizations	Includes high school, college and trade schools in the Targeted Areas; may also include elementary and middle schools, places of worship, recreation centers and neighborhood organizations.	Develop strategy for approval by NWCO.	Review and update annually
Support for job seekers	Provide access to a Project Office and a minimum of one computer for prospective employees.	Establish and promote available access.	Maintain or exceed commitment
Connect job seekers with training opportunities	Create or participate in strategy that addresses each of the following levels of training and certification: - Pre-skilled/pre-employment - Pre-journey level (associated with employment) - Journey upgrade/upskilling	Support efforts of WORKNOW across a range of job training programs and outreach.	Review and update quarterly

Work Component	Additional Description	Initial Measures (2018)	Ongoing
Reporting			
Desired Outcome: Create a baseline data set for NWC workforce activity outcomes			
Establish and monitor annual training targets	Training targets will be inclusive of performance measures, to be used as a tracking and reporting mechanism.	Develop training target strategy in coordination with WORKNOW.	Update and report annually
Identify and monitor target positions for recruitment	Identify target positions for recruitment and monitor success at filling the positions with qualified workers.	Develop training target strategy in coordination with WORKNOW.	Update for each work order and report quarterly
Track events	Track data for outreach events, including location, overall attendance and new contacts. Measure attendance at job fairs against actual hires that stem from them.	Provide strategy for approval by NWCO.	Report quarterly
Track number of hours worked by workers from Targeted Areas and Targeted Populations	Develop a coding system to capture information about each employee's residency data including veterans, and individuals formerly associated with the criminal justice system.	Develop tracking approach for approval by NWCO.	Report quarterly
Track utilization of training programs for "in-house" employees (self-performing work through Hensel Phelps or subcontractors), including breakout of employees from Targeted Areas and Populations	Includes utilization of pre-skill, pre-journey and journey upgrade programs and attainment of industry-recognized certifications; including on-the-job training hours, utilization of first-year construction workers or apprentices, and total number of licensed journey-level employees.	Develop tracking approach for approval by NWCO.	Report quarterly
Measure promotional success	Entravision Colorado will provide data on website interactions, including: (1) the traffic that the digital campaign is sending to the Project/Workforce website; (2) analysis of television and radio advertising campaigns, including reach, response (receptiveness) and demographic viewership analysis. Measure attendance at job fairs and Workforce Development events against actual hires that stem from them.		Report quarterly

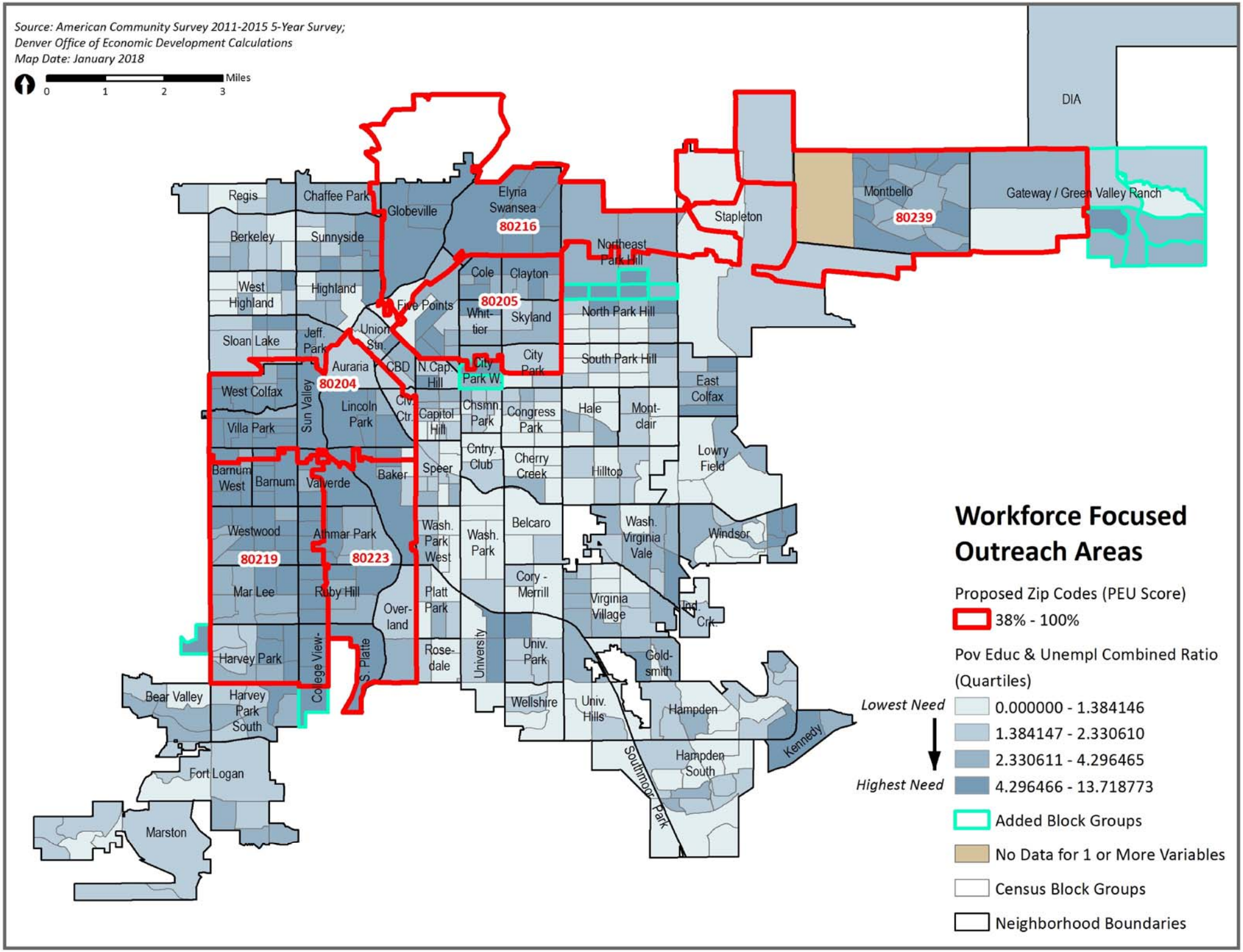
Source: American Community Survey 2011-2015 5-Year Survey;
Denver Office of Economic Development Calculations
Map Date: January 2018
Miles
0
1
2
3
DIA
Regis
Chaffee Park
Globeville
Elyria Swansea
80216
Berkeley
Sunnyside
Stapleton
Montbello
80239
Gateway / Green Valley Ranch
Northeast Park Hill
Cole
Clayton
West Highland
Highland
Five Points
80205
Whit-tier
Skyland
North Park Hill
Sloan Lake
Jeff. Park
Union Sta.
Auraria
CBD
N.Cap. Hill
City Park W.
City Park
South Park Hill
East Colfax
West Colfax
80204
Sun Valley
Lincoln Park
Civ. Ctr.
Capitol Hill
Chsmn. Park
Congress Park
Hale
Mont-clair
Villa Park
Cntry. Club
Cherry Creek
Hilltop
Lowry Field
Barnum West
Barnum
Valverde
Baker
Speer
Westwood
Athmar Park
Wash. Park West
Wash. Park
Belcaro
Wash. Virginia Vale
Windsor
80219
80223
Mar Lee
Ruby Hill
Over-land
Platt Park
Cory - Merrill
Virginia Village
Ind. Crk.
Harvey Park
College View-
S. Platte
Rose-dale
University
Univ. Park
Gold-smith
Bear Valley
Harvey Park South
Wellshire
Univ. Hills
Hampden
Kennedy
Fort Logan
Hampden South
Southmoor Park
Marston
Workforce Focused Outreach Areas
Proposed Zip Codes (PEU Score)
38% - 100%
Pov Educ & Unempl Combined Ratio (Quartiles)
Lowest Need
Highest Need
0.000000 - 1.384146
1.384147 - 2.330610
2.330611 - 4.296465
4.296466 - 13.718773
Added Block Groups
No Data for 1 or More Variables
Census Block Groups
Neighborhood Boundaries

Exhibit U – Health, Safety, Security and Environmental Plan

NATIONAL WESTERN CENTER CAPITAL BUILD PROGRAM
VERSION 3.2

Health, Safety, Security, and Environmental Program Plan for the National Western Center

April 24, 2018

Version Control Log

Author/Reviewer	Revision Number	Issue Date	Approval Date	Approved By	Modification Date	Description of Changes
Amanda Finnegan	1.0	7/20/2017	7/27/2017	SteerCom	NA	SteerCom approved Version 1.0
Amanda Finnegan	2.0	11/28/2017				To PAT for approval
CCD	3.0	03/11/2018				Risk and Legal
PJO	3.1	03/12				Minor Edits
Carla Rellergert	3.2	03/28				Changes to Section 2- Incidents and Section 4
PJO	3.3	3/29				Changes to E section

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Figures

Acronyms and Abbreviations

AHA	Activity Hazard Analysis
Authority	the National Western Center Authority
BCP	Business Continuity Plan
CAN	Corrective Action Notice
CCD	City and County of Denver
CDPHE	Colorado Department of Public Health and Environment
CIS	Capital Integration System
COMS	NWC Communications, Outreach & Marketing
CSU	Colorado State University
DDPHE	Denver Department of Public Health and the Environment
DEH	CCD Department of Environmental Health
DRIR	Denver Rock Island Railroad
ECS	Environmental Compliance Supervisor
EMS	Environmental Management System
EO	Executive Order
EPP	Environmental Program Plan
ESA	environmental site assessment
H&S	health and safety
HSSE	health, safety, security, and environmental
ID	identification
ISO	International Standards Organization
JHA	Job Hazard Analysis
KPI	key performance indicator
MMP	Material Management Plan
NWC E Program	National Western Center Capital Build Environmental Program
NWC	National Western Center
NWCO	Mayor's Office of the National Western Center
NWSS	National Western Stock Show (Annual Event in January, also the d.b.a. for WSSA)
OSHA	Occupational Safety and Health Administration
PAT	Program Alignment Team
PDCA	Plan-Do-Check-Act
PgMP	Program Management Plan
PIs	Performance Indicators
PMT	Program Management Team
PPE	personal protective equipment

Program	National Western Center Capital Build Program
PTSP	Pre-Task Safety Plan
PxP	Project Execution Plan
RACS	Regulated Asbestos Contaminated Soil
ReNEWW	Regeneration of Natural Environments, Energy, Water, and Waste
ROCIP	Rolling Owner Controlled Insurance Program
ROW	right-of-way
RTD	Regional Transportation District
SC	safety coordinator
SHELT	Safety and Health Executive Leadership Team
SME	Subject Matter Expert
SPCC	Spill Prevention, Control, and Countermeasures
SPP	Security Program Plan
SteerCom	Master Program Steering Committee
WBS	Work Breakdown Structure
WSSA	Western Stock Show Association (d.b.a. National Western Stock Show)

Terms and Definitions

Accident: An undesired event or sequence of events causing injury, illness, property damage or loss of life.

Aspect: Element of an organization's activities, processes, or services that can interact with the environment.

Conformance: Meeting the requirements of this Environmental Program Plan.

Corrective Action: Action taken to eliminate or mitigate the cause of a detected non-conformance, system deficiency, hazard, impact, or risk (fixing an existing problem) to prevent recurrence.

Enrolled Contractor: A contractor who is enrolled in the ROCIP.

Ensure: To make every reasonable effort to fulfill the requirement.

Environment: Surroundings in which an organization operates including air, water, land, natural resources, flora, fauna, and humans and their interrelation.

Guest/Visitor: An individual who is not knowledgeable of the program hazards and consequently poses a security or safety risk to themselves or the program, thus requiring escort.

Impact: Any change to the environment, whether adverse or beneficial, wholly or partially resulting from an organization's environmental aspect.

Incident: An unplanned event related to an organization's activities that can cause or could cause an undesired consequence including a work-related injury/illness, property damage, environmental impact, security, near miss, or other significant issues or concerns.

Near Miss: Occurs when an intervening factor prevents a spill or release, permit violation, or another event from occurring. An example includes: Secondary containment or emergency shutoff prevent a spill.

Non-conformance: A deficiency in meeting one or more of the requirements of this Environmental Program Plan.

Project Manager: A consultant or contractor designated with overall responsibility for the successful initiation, planning, design, execution, monitoring, controlling and closure of a project. Responsible for the development and delivery of contract deliverables, and the management, organization, communications and quality management of the design or construction team.

Record: A document showing or stating results achieved or attained, or providing information or data of activities performed.

Risk: An estimate of the combination of the likelihood of an occurrence of a hazardous event or exposure, and the severity that may be caused by the event or exposure.

Rolling Owner Controlled Insurance Program (ROCIP): A single insurance program including Workers' Compensation, General Liability, Contractor's Pollution Liability, and Builder's Risk insurance. Contractors and subcontractors performing construction or trades work (Enrolled Contractors) will be insured under the ROCIP.

Serious Incident: Includes:

- Work-related death or life-threatening injury or illness of an employee, subcontractor, or a member of the public.
- Kidnap/missing person.

- Acts or threats of terrorism.
- Event that involves a fire, explosion, or property damage that requires a site evacuation or is estimated to result in a greater than $500,000 in damage.
- Spill or release of a hazardous material or substances that involves a actual or imminent threat of significant harm to site workers, neighboring facilities, the community, or the environment.

Target Zero: The philosophy of continual improvement embedded in our Environmental Program Plan, where behaviors, systems and processes are continually assessed to make corrections before an incident occurs, incorporate what we learn and where the process starts over driving to zero incidents.

SECTION 1

Health, Safety, Security, and Environmental Commitment

The NWC Capital Build Program has embraced a philosophy for health, safety, security, and environmental excellence. NWC's safety culture empowers employees at all levels to accept ownership for safety and take whatever actions are necessary to eliminate injury in an environment where their concerns will be listened to and positively responded to. The NWC Capital Build Program leadership and management team is committed to world-class performance in HSSE stewardship and understands that world-class performance is a critical element in overall business success.

The NWC Program is committed to the prevention of personal injuries, occupational illnesses, and damage to equipment and property in all its operations; to the protection of the general public whenever it comes in contact with the NWC Capital Build program; and to the prevention of pollution and environmental degradation.

NWC management, field supervisors, and employees plan safety into each work task to prevent occupational injuries and illnesses. The ultimate success of the NWC safety program depends on the full cooperation and participation of each individual.

To achieve NWC's HSSE vision, each employee must personalize this goal, make a commitment to the Target Zero philosophy described in Section 2.2, and actively participate in striving toward industry leadership in this field.

The NWC has developed an HSSE Commitment policy to outline the expectations of the program with regards to HSSE.

Health, Safety, Security, and Environment Policy Commitment

Protection of people and the environment is a core value for the National Western Center Program Management Team. It is our vision to create a culture that empowers everyone working on the Program to drive this value throughout the program to achieve excellence in health, safety, security and environment (HSSE) performance. The NWC Program has created an itegrated leadership committee, the Safety, Health, and Environmental Leadership Team (SHELT), to ensure communication and information sharing across the NWC management teams and provide guidance to support our goal of Target Zero.

The program's Target Zero culture focuses on putting HSSE at the forefront of all activities so that incidents are prevented. The culture is about developing a workplace where everyone understands their obligations and actively participates in the continuous improvement of HSSE by observing, engaging, and improving. We care about everyone's safety and expect all management, staff, and workers to embrace our culture, share our core values for the protection of people and the environment.

The NWC Program is committed to:

- Providing leadership by communicating performance expectations, reviewing and tracking performance, and encouraging a culture of collaboration between management, staff and workers to be safe, secure and environmentally responsible and to continually improve our program.
- The expectation that all NWC employees, staff and workers will take responsibility for their actions, maintain open lines of communication, and participate in preventing safety hazards and environmental impacts.
- Protecting the environment by executing an environmental program to assure projects meet and exceed environmental compliance obligations.
- Leading continual improvement towards achieving world class HSSE performance by setting targets, reporting performance and routinely evaluating our program.
- Providing a workplace free of violence by maintaining a zero tolerance for workplace violence and exercise all reasonable efforts to prevent it.
- Attaining zero HSSE incidents to achieve Target Zero.

1.1 Introduction

This health, safety, security, and environmental (HSSE) assurance program will be incorporated in ongoing event operations and capital build activities through designated areas of responsibility. This plan outlines the responsibility for the National Western Center (NWC) Capital Build Program (Program) for its HSSE assurance plan and the interface between operations and the Capital Build Program. This document serves to define and articulate the program requirements and expectations of all projects and activities under the Capital Build Program.

This *HSSE Program Plan* is structured in the following sections, which are complementary to each other to assure coherence between the different elements of the overarching HSSE program for the Capital Build Program:

- Section 2 – Health and Safety Program Plan
- Section 3 – Security Program Plan
- Section 4 – Environmental Program Plan

NWC Program HSSE performance is centered on the Target Zero philosophy, which uses the Plan-Do Check-Act methodology, to continually strive for zero incidents, while recognizing that incidents could potentially occur.

1.2 Capital Build Program HSSE Management

The NWC Capital Build Program *Governance Handbook* designates the Safety and Health Executive Leadership Team (SHELT) as the sponsor for the HSSE program. This team is chaired by the Program Manager and is directly accountable to the Program Alignment Team (PAT) and, ultimately, the Steering Committee (SteerCom). The program will establish key performance indicators (KPIs) and performance indicators (PIs) to measure success against goals.

The identified KPIs will be monitored by the NWC Program Assurance team through the reporting mechanisms and assurance functions. The information will be provided to the NWC Program Manager and the SHELT. The NWC Program will use this information for setting priorities and actions for continual improvement under the Target Zero program.

SHELT will designate an HSSE assurance manager for the Capital Build Program. This person will oversee the implementation of this NWC Capital Build *HSSE Program Plan*. SHELT will maintain adequate resources to comply with programmatic and common area HSSE standards. Each individual contractor will meet the minimum requirements in this plan and will be responsible for coordination with SHELT.

To reflect the complexity and transitional nature of the Capital Build Program, it is imperative there is a clear delineation between areas of the campus that are under the control of the construction (Capital Build) program and the operations/public right-of-way areas of the site. At all times during the capital build delivery phase, space that makes up the entirety of the campus will be designated as one of the following:

- **Construction Zone:** This zone is an area that is in the full control of a Capital Build Program construction contractor, and control of that area has been formally handed over to that contractor. All work/people within the boundary of the area will be delivered and controlled in accordance with the contractor's site-specific HSSE management requirements and the ROCIP Safety Manual (for Enrolled Contractors).
- **Third Party and/ or Equity Partner Construction Zone:** This zone is an area that is in the full control of a Third Party and/ or Equity Partner Construction Contractor and control of that area has been formally handed over to that contractor. All work/people within the boundary of the area will be delivered and controlled in accordance with the contractor's site-specific HSSE management requirements.
- **Public Rights-of-Way:** Activities in public rights-of-way (ROWs) will be in accordance with the City and County of Denver's (CCD) policies, processes, and procedures. For work that will be carried out in these areas, the necessary ROW approvals will be required with appropriate HSSE controls as required by CCD.
- **Operations Zone:** These are the areas of the site that are under the control of the Western Stock Show Association (WSSA), the National Western Center Authority (once established), Colorado State

University (CSU), or third-party operations on the site. All work or access needed in these areas will be subject to the operationally responsible owner's HSSE coordination, requirements, and approvals.

- **Rail Zone:** These are the areas of the site that have active rail lines. There are lines for Regional Transportation District (RTD), BNSF, and Denver Rock Island Railroad (DRIR) within the NWC Capital Build boundaries. Additional specific training is required for entering the different rail areas. Those individuals not required to work within a rail zone shall avoid all rail zones and follow posted signage.

Any construction activities by NWC equity partners or other third parties will maintain this program as a minimum point of HSSE compliance. SHELT will maintain an up-to-date map of the site showing the spatial responsibilities of the site at any one time as designated above.

1.3 Operations HSSE Management

Prior to construction activities, the operational owner of facilities, such as WSSA, will hold primary HSSE responsibility for designated areas under its control. The NWC Program Management Team (PMT) will work with these operational owners to identify these areas.

Construction zones could revert to operational zones for certain interim uses with appropriate inspection and validation of safety and security for the proposed use. In these cases, the operational owner or manager will assume responsibility for the HSSE program until the site reverts to a construction zone. The NWC Capital Build Program HSSE manager will validate that the site returns to the Capital Build Program in a similar condition as a construction zone.

1.3.1 Internal and External Communication

1.3.1.1 Internal Communication

The objectives of the *HSSE Program Plan* internal communication are to:

- Emphasize the NWC core value of Target Zero
- Increase awareness of the NWC Program HSSE Policy
- Educate staff, employees and workers on *HSSE Program Plan* targets and objectives
- Promote open lines of communication
- Reinforce project and contractor involvement in continual improvement
- Inform NWC staff and employees about the overall performance of the NWC HSSE Program
- Provide projects feedback on the results of *HSSE Program Plan* monitoring, assessments, and management reviews
- Report on NWC HSSE Program progress and performance

Internal communication will be achieved through a wide variety of methods including:

- Training as described in Section 4.4
- SHELT meetings with periodic communications to projects
- NWC HSSE Newsletter managed by COMS
- Project and contractor shared lessons learned
- CCD/Denver Department of Public Health and the Environment (DDPHE) shared lessons learned
- HSSE badge cards
- NWC Program internal website

1.3.1.2 External Communication

External communications include efforts to assist NWCO in meeting its requirements and efforts to obtain, as appropriate, local community advice relevant to NWC Program activities. Local community advice is obtained through a variety of communication channels including the NWC Program telephone hotline.

The NWC Office of Communications is the primary organization to receive and address health, safety, security and environmental inquiries from external audiences, such as the public, stakeholder organizations, media, and other external parties. DDPHE is responsible for all regulatory stakeholder engagement. Community complaints will be managed based on a coordinated *Community Complaints Management Practice* with DDPHE.

The NWC Communication Director will work with the appropriate CCD offices, NWC Program staff, and NWC Program Environmental Manager, as well as coordination with DDPHE to determine how to best address any inquiry.

The NWC Program communicates the NWC Program HSSE Policy by posting it on the NWC external website at (www.nationalwesterncenter.com). The NWC Program will share HSSE Program and performance information through various reports.

1.4 National Western Center Authority Responsibilities

Upon substantial completion of individual projects identified in the NWC Capital Build Work Breakdown Structure (WBS) baseline, the National Western Center Authority (Authority) will assume responsibility for the common areas and physical facilities in that WBS element. The Authority will work with SHELT and program HSSE staff to maintain integration of these programs.

1.5 Management Review

Management review of the *HSSE Program Plan* is performed on annual basis by SHELT to assess ongoing suitability, adequacy, and effectiveness in meeting performance requirements. This review is a critical part of the continual improvement process. The *HSSE Program Plan* elements reviewed may include the NWC Program's overall HSSE performance, the results of NWC Program assessments, an independent assessment, and an evaluation of any significant new regulatory requirements or NWC Program requirements.

The responsibility for ensuring management reviews are conducted is held with the Program Environmental Manager, the Program HSSE Assurance Manager, and SHELT. The Program Environmental Manager and HSSE Assurance Manager ensure the necessary information and evidence is collected and presented to allow management review. The outcome of the management review, based on a review of KPIs, results in the development and/or modification of next year's KPIs or a retention of the existing KPIs. Key initiatives are presented to the Equity Partners for their review and concurrence, which may include changes to the NWC Program HSSE Policy, objectives and targets, resources, or additional key elements.

SECTION 2

Health and Safety Program Plan

2.1 Introduction

2.1.1 Purpose

This section describes the health and safety program plan that will be used by the National Western Center Capital Build Program. The purpose of this plan is to set out the expectations and minimum requirements for all entities that design, deliver, supervise, or engage with the NWC Capital Build Program; individual site-specific health and safety (H&S) plans will be assured against these requirements. However, this plan is not intended to replace any equity partner, contractor H&S programs, policies, or procedures, ROCIP Safety Manual, or federal, state, or local regulations; rather, it contains a framework into which individual entities will work under the NWC program.

2.1.1.1 Health and Safety Mission

*"**Safely** deliver the initial facilities and public spaces on time and on budget to create the NWC – while preserving visitor experience, respecting site legacy, and enhancing the community asset."*

Capital Build Program Team Mission. It is the mission of the NWC Capital Build Program for all work to be performed in the healthiest and safest manner possible. Safety must never be compromised. The program is fully committed to having everyone who works at NWC or is impacted by the work go home in the same condition they arrived. To fulfill the requirements of this policy, an organized and effective H&S program must be carried out across program activities and in each location where work is performed.

The NWC Program believes that all injuries are preventable, and we are dedicated to the goal of a safe and healthy work environment. To achieve this goal, all employees on the project must assume responsibility for their own and others' health and safety. Every employee is therefore empowered to:

- Conduct their work in a safe manner, including healthy work practices that prevent long-term health impacts of activities performed.
- Stop work immediately to correct any unsafe condition that is encountered, with the knowledge that those involved will positively respond to a concern raised.
- Take appropriate corrective actions before re-commencing work so that work may proceed in a safe manner.

It is NWC's policy and expectation that all employees, contractors, and visitors to the Capital Build Program construction zones will:

- Work safely.
- Protect the environment.
- Comply with HSSE policies, procedures, and training requirements.
- Report unsafe work conditions and actions.
- Report all HSSE incidents, including near-misses.

Safety, occupational health, and environmental protection will not be sacrificed for production. These elements are integrated into quality control, cost reduction, and job performance, and are crucial to our success.

2.1.2 Program Health and Safety Objectives

All managers and employees are to strive to meet the program H&S objectives. The team will be successful only if everyone makes a concerted effort to accomplish these objectives. The objectives allow the program to stay focused on optimizing the health and safety of all personnel, making the program a success.

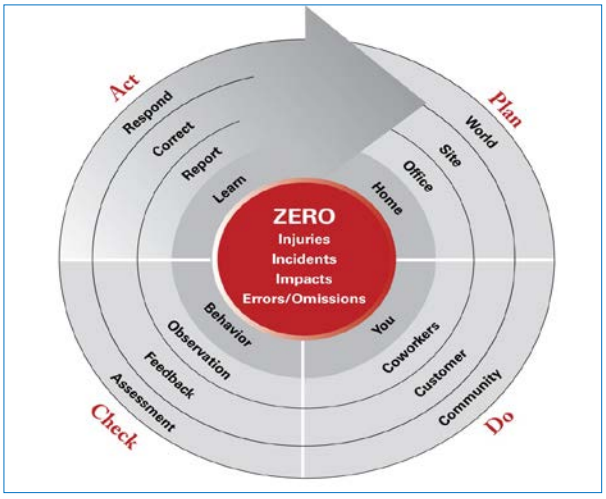
Each project manager will be responsible for cascading the expectations set out by the NWC HSSE program and will be required to reflect project-specific HSSE objectives or KPIs within the project's Project Execution Plan (PxP) and to flow requirements to contractor's site-specific H&S plans. These will include proactive metrics such as leadership field visits and safety observations. All Third Party and/ or Equity Partner contractors will determine how their H&S metrics will be collected and reported at a project level.

The program has established 10 specific H&S objectives:

1. Create an injury-free environment.
2. Have zero recordable injuries or incidents.
3. Provide management leadership for health and safety by communicating performance expectations, reviewing and tracking performance, and leading by example.
4. Ensure effective implementation of the H&S plans through education, delegation, and teamwork.
5. Ensure 100 percent participation in training programs, personal protective equipment (PPE) use, and HSSE compliance.
6. Continuously improve safety performance through proactive management and assessment of incidents and trends within the safety triangle and sharing lessons learned and updating the expectations in this plan.
7. Maintain free and open lines of communication.
8. Require all personnel involved in the program to make a personal commitment to safety as a value.
9. Focus safety improvements on high-risk groups.
10. Continue strong employee involvement initiatives.

2.2 Strategy

The vision and strategy of the NWC Program management team is to deliver a world-class safety program focusing on a Target Zero philosophy. This will be accomplished by using the Plan-Do-Check-Act (PDCA) methodology. This Target Zero philosophy focuses on zero incidents, accidents, omissions, and environmental impacts. An effective safety program uses a top-down and bottom-up approach where everyone is responsible for making sure we are operating in a safe, high-quality, and high-performance work environment. Target Zero is a cultural imperative for the NWC Program.



Several key components are necessary to ensure a successful health and safety program. They are:

- A health and safety management system that includes all elements of the H&S program applied to the capital build program (including but not limited to SHELT, this H&S Program Plan, Project Manager objectives and KPIs, contractor H&S plans, and the ROCIP Safety Manual)
- Visible leadership support and engagement
- Detailed preplanning and communication
- Trained and competent employees
- Culture of reporting and continuous improvement

2.2.1 Roles, Responsibility and Authority

2.2.1.1 Office of the National Western Center

It is the responsibility of NWCO to work independently of other CCD agencies and departments, and to direct and coordinate on behalf of the Mayor, the efforts of other departments and agencies regarding the NWCO. NWCO makes health and safety decisions in compliance with applicable local, state, and federal laws and are consistent with the overall NWC Program delivery strategy.

2.2.1.2 NWC Program Executive Leadership

The NWCO Program Director, NWC Program Manager, and the Horizontal and Vertical Portfolio Managers are responsible for demonstrating leadership and commitment to the Health and Safety Plan as well as providing executive management for the NWC Program. These responsibilities include:

- Develop and implement a NWC Program HSSE Policy that emphasizes Target Zero HSSE performance.
- Establish KPIs to measure success against NWC Program goals, which includes HSSE KPIs and includes performance metrics in routine performance reporting.
- Establishes and maintains SHELT to ensure communication and implementation of the performance expectations of the program
- Commits NWC Program resources required to meet health and safety performance expectations.

2.2.1.3 NWC Portfolio Managers

NWC Portfolio Managers are responsible for assuring the overall implementation of the NWC HSSE Program across their project management and delivery teams, demonstrating leadership and commitment in the NWC HSSE Program.

2.2.1.4 NWC Project Managers (including subcontractors at all tiers)

NWC project managers (consultant or contractor) designated with overall responsibility for the successful implementation of the HSSE program on their project. They must ensure safe systems of work across all stages of planning, design, construction, and operation. They will ensure all personnel on their projects participate in the project HSSE onboarding orientation.

2.2.1.5 Contractor Safety Representative

All contractors must assign a fulltime safety professional to monitor the safety of their employees and subcontractors, provide employee safety orientation, enforce all safety standards, rules and regulations, oversee accident investigations and completion of reports, and maintain records as required by this HSSE program, the ROCIP Safety Manual (for Enrolled Contractors), and federal, state, and local requirements.

2.3 Operational Controls

2.3.1 ROCIP Safety Manual

All Enrolled Contractors must follow requirements of the ROCIP Safety Manual, which has been drafted to work in partnership with the HSSE program. The ROCIP has specific safety requirements that in many instances exceed current federal, state, or local safety standards, such as pre-employment drug testing. It also contains more detailed safety requirements of high-risk operations including fall protection, excavations and trenching, confined-space entry, crane operations, electrical work, and hot works, among others. Workers Compensation claim reporting instructions and treating clinics are also included in the ROCIP Safety Manual. Therefore, all Enrolled Contractors must be familiar with both the HSSE program requirements and the ROCIP requirements.

2.3.2 Review Mechanisms

2.3.2.1 Subcontractor Performance Review

Contractors will be evaluated on their past HSSE performance to ensure they have effective programs in place. The review may review incident rates, training programs, work related fatalities, Substance Abuse Program that meet the ROCIP safety manual requirements (for Enrolled Contractors) in addition to other elements of their programs.

2.3.2.2 Design Stage Review

Design teams can make a significant contribution to the reduction of risk through the careful consideration of hazards that would be present during construction, use, and maintenance (Figure 2-1). The design stage review process described in the *Program Management Plan* (PgMP) Section 2.2.4.4 will assure that designs utilize engineering methods to alleviate risks associated with construction, operation, and maintenance, and risks identified during design will be communicated to the construction contractor prior to commencement of work.

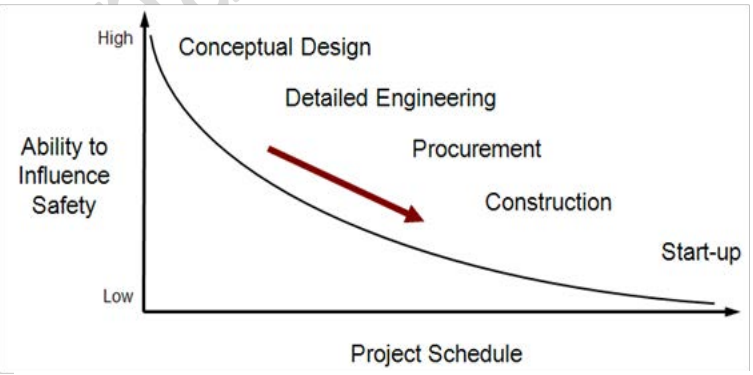


Figure 2-1. Health and Safety Risk Reduction through Design

2.3.2.3 Health and Safety Plan Review

Detailed preplanning efforts are a key element in ensuring a safe program. The contractor is responsible for developing a comprehensive site-specific HSSE program and management system that outlines the requirements, policies, and guidelines, and prescribes the roles and responsibilities of different parties to ensure awareness and compliance to the Target Zero culture. H&S plans will be submitted by all contractors for review and acceptance by the project manager in coordination with the HSSE Manager and ROCIP Safety Manager (for Enrolled Contractors) prior to commencement of work. Plans will be expected to cover at a minimum:

- Health and safety management system
- Activity hazard analysis or equivalent
- Managing and monitoring compliance by conducting frequent audits and performing regular inspections

- Written field observations by senior leadership
- Lessons Learned and dissemination
- Conducting regular training to ensure ongoing learning and promote the Target Zero Culture
- Emergency response
- Incident reporting
- Drug testing
- Confidentiality

2.3.2.4 Audits, Inspections, and Assessments

Review of programs and performance is a basic but critical step in the Plan-Do-Check-Act methodology. Audits and inspections are expected to be an integral part of each contractor's H&S plan. These will be both internal by using self-assessment checklists and external by using formal external assessments. Action items will be maintained and tracked to completion. This will ensure continuous improvement throughout the life of the program. The Program will perform assessments to ensure that the contractors are complying with their own HSSE Programs. Third Party and/ or Equity Partners will determine their own audit, inspection, and assessment process and timing.

2.3.3 Communication

Timely and appropriate communication is necessary for the day-to-day execution of a project and the delivery of the H&S program objectives. The program will establish a H&S communication program, owned by SHELT, to disseminate information on a regular basis. This will facilitate communicating the Target Zero philosophy as well as sharing performance, lessons learned, and pertinent information among the projects.

2.4 Safety Documentation and Recordkeeping Requirements

Proper documentation and record keeping of safety related functions is essential. Project managers are ultimately responsible to ensure records are readily available for review by appropriate parties or purposes, such as:

- Management reviews - NWC Portfolio Managers, SHELT, ROCIP Safety Manager, ROCIP Insurance Broker, ROCIP Insurance Companies, CCD Risk Management.
- OSHA investigations, audits, or other legal matters.
- Records needed on short notice in case of an accident, illness, or other emergency.

The established project filing system will be the point of storage of all H&S documentation. It will be the Project Manager or contractor Safety Representative's responsibility to maintain up-to-date records and documentation, as required. A policy on protection of employees' personally identifiable information and personal health information, including proper destruction of related information, must be part of all electronic and paper filing systems. The following information is an example of what should be identified in the H&S section of the project filing system:

- Project H&S plans
- All safety training courses completed
- Job Hazard Analysis (JHA) forms
- Pre-Task Safety Plan forms

- Completed permits (confined-space entry, etc.)
- Project activity self-assessment checklists
- Subcontractor activity-specific safety procedures
- Monthly reporting of HSSE performance and KPI metrics

2.5 Individual Standards of Conduct

NWC is committed to providing a safe, secure, and environmentally responsible workplace for all employees, and fostering a culture focused on continual improvements to its HSSE programs. NWC seeks to provide a working environment in which employees are empowered and encouraged to identify opportunities for HSSE improvements.

All employees, regardless of the entity they work for, will be expected to conduct themselves in accordance with the Safe and Healthy Work Policy described in Section 2.1.1.1 above

All individuals associated with this program must work injury-free and drug-free and must comply with the program's standards of conduct, this HSSE Program Plan, and the safety requirements of the entity to which they work. Program safety standards of conduct save lives and promote safe behaviors across the workforce.

Every organization within the program will outline its policy for enforcement of the program standards of conduct and establish disciplinary measures for prohibited actions and H&S offenses. These will be included in respective contractor H&S plans.

2.6 Reporting Unsafe Conditions or Practices

Responsibility for effective H&S management extends to all levels of the project and requires effective communication between employees, supervisors, and management. Accident prevention requires a proactive policy on near-misses, unsafe conditions, and unsafe practices. All personnel must report any situation, practice, or condition that might jeopardize the safety of the NWC Program and surrounding community. All unsafe conditions or unsafe practices will be corrected immediately and lessons learned developed and submitted to the program SHELT for dissemination. NWC has zero tolerance of unsafe conditions or unsafe practices.

No employee or supervisor will be disciplined for reporting unsafe conditions or practices. Individuals involved in reporting the unsafe conditions or practices can remain anonymous.

The following reporting procedures will be followed by all project employees:

1. Upon detection of any unsafe condition or practice, the responsible employee will attempt to safely correct the condition.
2. The unsafe condition or practice will be brought to the attention of the worker's direct supervisor, unless the unsafe condition or practice involves the employee's direct supervisor.

Either the responsible employee or responsible employee's direct supervisor is responsible for immediately reporting the unsafe condition or practice to the appropriate H&S representative.

2.7 Planning

2.7.1 Health and Safety Plans

Every field project within the NWC Program will have a detailed site-specific H&S plan. As the projects within the NWC Program vary in scope, the required level of detail will also vary. These plans will provide an adequate amount of detail to ensure employees have the proper tools to perform their jobs

safely. They will also provide the necessary guidance on hazard analysis, frequency of inspections, safety observation expectations, incident reporting, and work plans specific to the tasks within the scope. A written site-specific H&S plan must be submitted for review to the CCD ROCIP Safety Manager at least 30 days before mobilization.

2.7.2 Job Hazard Analysis

Many accidents and incidents arise from inadequately assessing work activities involving significant risk and associated hazards, as well as inadequately planning, preparing, communicating, and following an agreed safe system of work.

When such work activities are adequately assessed and the required documentation and processes put in place and suitably communicated to the work teams involved, the potential for those significant risks and their associated hazards are greatly reduced.

Completion of a Job Hazard Analysis (JHA) reduces the risk of accidents and incidents by assessing and mitigating hazards before work begins.

JHAs will be conducted for *all work* activities in which there is a *risk of injury* because of a potential exposure to a hazardous condition or a hazardous substance. JHAs shall be revised whenever there is a change or a new risk is identified and shall be maintained and reviewed periodically by the appropriate supervisor. JHAs will:

- **Identify** the hazards associated with the work activity.
- **Assess** the health and safety risks of each person likely to be affected by those hazards.
- **Identify** the individuals or groups of people who are at risk.
- **Eliminate** the hazards, where possible.

Where hazards cannot be eliminated, **identify** and **implement** appropriate measures to reduce and control the risks, using the following general principles of prevention:

- Avoid the risk, where possible
- Evaluate risks that cannot be avoided
- Combat risk at source
- Change the method of work to suit the individual
- Make use of technological developments
- Replace the dangerous with less dangerous
- Give priority to collective measures over individual protection
- Provide appropriate instruction and training
- Provide effective monitoring and review to ensure that measures remain effective

The responsible supervisor will review all JHAs with project personnel performing the activity in a safety briefing, prior to activity performance. New crew members must be briefed on the JHA prior to performing the activity.

JHAs will be documented and maintained onsite. Enrolled Contractors should see ROCIP Safety Manual for sample JHA forms.

The following hazardous work operations are examples (but not a complete list) of activities typically requiring JHAs:

- Confined-space entry
- Construction inspection
- Excavation entry
- Exposure to live electrical
- Lockout/tagout

- Respiratory protection
- Use of personal fall arrest systems
- Temporary traffic control
- Working from scaffolds
- Drilling

2.8 Personal Protective Equipment

2.8.1 General Information

The NWC Capital Build program has a strong commitment to the safety of those who work and/or visit construction zones under its control. As such, the Capital Build Program has set a minimum standard of PPE required for entry, working, or visiting the construction zones and construction within ROW, which each contractor will be expected to enforce on the construction zones it controls. The required PPE include:

- ANSI Z89.1 Hard hat
- ANSI Z 87.1 Safety Glasses
- High-visibility vest/jacket (orange unless otherwise noted in specific work areas)
- Gloves
- Leather boots with safety toe
- Ear protection available/worn on person

When additional actual or potential hazards exist and engineering controls or safe work practices cannot eliminate the hazard, the contractor will be required to assess additional PPE requirements for its employees and advise visitors of additional PPE if required in certain areas of the site. PPE requirements in each construction zone will be posted at the site entrance, and in appropriate locations across the zone. The contractor will provide field personnel with the required project-specific PPE and training, and will have additional PPE available to support prearranged visitors.

Employees are responsible to:

- Acquire the necessary PPE from the employer.
- Complete the appropriate training to learn the proper use and care.
- Use PPE as required in the contractors H&S plan or as directed by site signage and supervisory staff.
- Inspect PPE prior to use and maintain it in a clean and safe condition.
- Not modify, tamper with, or repair PPE beyond routine maintenance.
- Inform the employer of equipment that is damaged.
- Inform the employer of equipment that they believe does not adequately protect them from actual or potential hazards.

2.8.2 Hazard Assessment

The employer will identify actual or potential hazards and the need for PPE. Two conditions typically dictate the necessity for PPE: general hazards present in the work area, and hazards created by the tasks being performed. Some work areas have actual or potential hazards that can be present at any time, thereby potentially exposing any personnel working or walking through the area. Such areas should be posted as PPE-required areas, or personnel should be informed of the requirements in an equivalent manner. In addition, the actual task being performed may create a hazard and require personnel who perform this task to wear appropriate PPE. The areas where these tasks are taking place may become PPE-required areas as long as that specific task is taking place.

2.8.3 Training

PPE users must receive training from their supervisor on the proper care, maintenance, and limitations of PPE, in addition to instructions on how to wear and adjust PPE. The proper use of PPE should also be included in project safety briefings and toolbox meetings.

2.9 Medical Surveillance

Specific tasks within the program may require specialized medical surveillance to ensure employee safety and health. This surveillance could include biological monitoring for specific compounds or specialized medical evaluations. Examples of programs that may require surveillance are hearing conservation, respirator use qualification, or lead abatement. Each employer will evaluate the potential exposures for its employees and implement effective medical surveillance programs where required.

2.10 Jobsite Safety Inspections

The contractor's safety representative will conduct and document daily jobsite inspections of the worksite to evaluate compliance with the site-specific H&S plan and ROCIP Safety Manual (for Enrolled Contractors). Hazards will be identified and corrected. Inspection reports must be documented daily and made available for review.

2.11 Required Safety Training

2.11.1 Program and Project Employee Orientation

Employees expecting to perform field work or access the project site are required to participate in employee orientation training so that a clear and consistent message is delivered. This mandatory orientation will occur prior to working anywhere on the NWC Capital Build Program. If Third Party and/ or Equity Partner contractors are required to pass through the NWC construction zones, but not perform work, a specific traffic right-of-way can be established to eliminate the requirement for the NWC specific Onboarding. Basic NWC Onboarding information and expectations can then be added to the Third Party and/ or Equity Partner project specific training. This does not replace contractor or site-specific orientation requirements set out in H&S plans. This orientation will be owned by SHELT and the ROCIP Safety Manager (for Enrolled Contractors) and include (as a minimum):

- Overview of the program (policies and rules)
- Commitment of the Program Management to HSSE
- Individual's responsibility for HSSE
- General site conditions and risks
- Overview of zones and roles and responsibilities of different entities
- Program minimum expectations (including PPE, standards of conduct, incident reporting)
- Points of contact
- Drug free workplace and substance abuse testing

In addition, it is expected that each contractor will have an orientation that aligns with their specific needs and the overall program orientation program described above. The information discussed in the orientation with project personnel and visitors to their project site will include:

- Project scope of work
- Contractor's site-specific H&S plan
- Overall site safety briefing (general site safety)
- Employee responsibilities

- Emergency procedures and evacuation plan that is part of site-specific H&S plan
- Injury and incident reporting, return to work programs, and designated provider information
- Reporting procedures for hazardous conditions and activities

Attendance must be documented and reported to the ROCIP Safety Manager prior to issuance of project ID card.

2.11.2 Employee Training

All contractors will provide the necessary training to ensure that all employees conduct their work in a safe manner and comply with applicable regulations.

2.11.3 Supervisory Training

The presence of competent front-line supervisors who are fully committed to the HSSE program is essential to ensure that HSSE targets are achieved. Contractors must include training topics for all front-line supervisors (such as recognizing unsafe behavior, understanding how to resolve issues and escalate procedures, delivering toolbox talks, and developing and implementing JHAs). OSHA 10-hour training is mandatory for management and supervisors including foreman, as well as all HSSE staff. The aim of the training objective is to improve HSSE awareness and delivery and ultimately reduce incidents in delivering the NWC Program

2.11.4 Training Documentation

All training will be documented. Documentation and certificates verifying completion will be maintained onsite or electronically by the employer. Training documentation will be made available for review at all times.

2.12 Incident Reporting, Investigation, and Management

2.12.1 Definitions

Incidents are events that cause or could have caused undesired consequences. An incident may be caused by natural forces, employees, subcontractors, or members of the public in any location associated with NWC Program operations, including offices, warehouses, project sites, private property, or public spaces. Incidents could include:

- Injury or illness to a NWC Program employee, contractor, or subcontractor employee
- Property damage
- Spill or release of hazardous or regulated material
- Environmental or permit violation
- Environmental related complaints (any response> 24 hours; 5 within 1 month)
- A “near-miss”
- Other (e.g., fire, explosion, bomb threat, workplace violence)

Near-misses occur when an intervening factor prevents an injury or illness, property damage, spill or release, permit violation, or other event from occurring. For example:

- A hard hat or other PPE prevented an injury.
- Secondary containment or emergency shutoff prevented a spill.

An observed hazard is not a near-miss.

Serious incidents must be immediately reported to senior management. Serious incidents include:

- Work-related death or life-threatening injury or illness of an employee, subcontractor, or member of the public
- Kidnap/missing person
- Acts or threats of terrorism
- Event that involves a fire, explosion, or property damage that requires a site evacuation or is estimated to result in greater than $500,000 in damage
- Spill or release of hazardous materials or substances that involves actual or imminent threat of significant harm to site workers, neighboring facilities, the community, or the environment

2.12.2 Incident Notification

Contractor's site-specific H&S plans must include a notification process that encourages employees to report all incidents, including near-miss and serious incidents. All such incidents must be documented and reported. Enrolled Contractors must follow the requirements in the ROCIP Safety Manual. Such reports will be made available to NWC Project Manager, as requested. All designers, contractors, and Third Party and/ or Equity Partners will be required to report their H&S performance monthly as part of their overall reporting.

2.12.3 Incident Investigation

The purpose of an incident investigation is to understand how the incident happened, analyze the root causes, and prevent recurrence by implementing corrective actions and distributing lessons learned.

- Incident investigations will be initiated by the supervisor or Project Manager and completed as soon as possible, but no later than 72 hours after the incident has occurred. An incident investigation report will be completed and filed in the HSSE Program section of the program SharePoint system. It is the Project Manager's responsibility to assure that all incident reports are filed on SharePoint and updated to final once all corrective actions have been completed.
- The level of the investigation will be determined by the significance or severity of the incident.
- The Project Manager and contractor safety representative will implement all corrective actions.
- Lessons learned will be distributed as needed and the Project Manager will verify that corrective actions are implemented to prevent similar incidents.

2.12.3.1 Program Incident Root Cause Analysis

Incident analysis is essential in identifying all causes of an incident and determining the corrective actions taken to prevent reoccurrence. The investigation team will consist of the contractor safety representative, the responsible supervisor, ROCIP Safety Manager, and a designated representative of SHELT (as determined by the SHELT Chair). For environmental incidents, the contractor's responsible environmental manager will also be present.

The Root Cause Analysis form must be completed for all loss incidents and near-miss incidents. This form must be submitted to the investigation team for review and inclusion in the investigation report.

For minor losses or near misses, the information may be gathered by the supervisor or other personnel immediately following the loss. Based on the complexity of the situation, this information may be all that is necessary to enable the investigation team to analyze the loss, determine the root causes, and develop recommendations. More complex situations may require the investigation team to revisit the

loss site or re-interview key witnesses to obtain answers to questions that may arise during the investigation process.

Photographs or videotapes of the scene and damaged equipment should be taken from all sides and from various distances. However, injured employees confidentiality must be protected at all times.

The root cause analysis flowchart (Figure 2-2) can assist in identifying the root cause(s) of a loss. Any loss may have one or more root causes and contributing factors. The root cause is the primary or immediate cause of the incident, while a contributing factor is a condition or event that contributes to the incident happening but is not the primary cause of the incident.

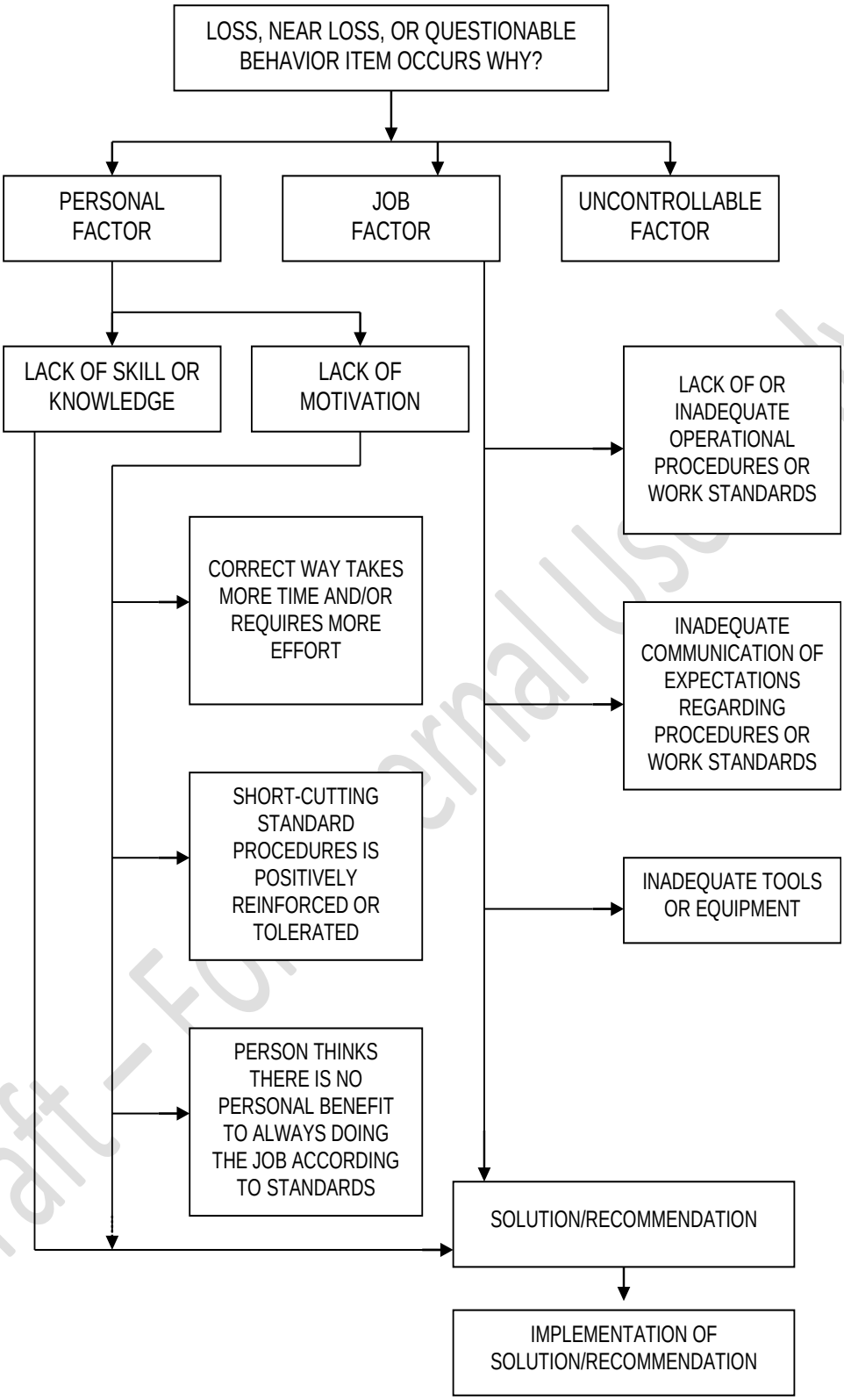


Figure 2-2. Root Cause Analysis Flowchart

Root causes and contributing factors that relate to the person involved in the loss, his or her peers, or the supervisor should be referred to as "personal factors." Causes that pertain to the system within which the loss or injury occurred should be referred to as "job factors."

Example personal factors:

- The person lacks skill or knowledge.
- The correct way takes more time and requires more effort.
- Short-cutting standard procedures is positively reinforced or tolerated.
- The person thinks there is no personal benefit to always doing the job per standards.

Example job factors:

- Operational procedures or work standards are lacking or inadequate.
- Communication of expectations regarding procedures or standards is inadequate.
- Tools or equipment are inadequate.

The root cause(s) could be any one or a combination of these seven possibilities or some other uncontrollable factor(s). In the vast majority of losses, the root cause is related to one or more of these seven factors. Uncontrollable factors should be used rarely and only after a thorough review eliminates all controllable factors.

2.12.3.2 Corrective Actions

The investigation report will include all corrective actions taken or those that should be taken to prevent recurrence of the incident. The report will document the specific actions to be taken, the employer and personnel responsible for implementing the actions, and a timeframe for completion. Be sure the corrective actions address the causes.

Once the investigation report has been completed, the Project Manager will hold a review meeting to discuss the incident and provide recommendations. The responsible supervisors will be assigned to carry out the recommendations. SHELT and the ROCIP Safety Manager (for Enrolled Contractors) will review and comment on the investigation, corrective actions, and ensure contractors complete the agreed upon corrective actions.

2.13 Emergency Preparedness

An emergency could involve an injury to a worker, an explosion, evacuation, fire, or chemical release. Employees must know what to do if an emergency occurs. This requires preplanning and communication of these plans to employees. A program-level HSSE Crisis Management Plan will be developed by the PMT and owned by SHELT. For a specific project for the NWC development area, compliance with the expectations set out in this section will be addressed as well as any specific emergency preparedness requirements. Project-level plans will also be created by each company responsible for a specific project and included in the project-specific employee orientation.

2.13.1 Pre-emergency Planning

The following pre-emergency planning activities are to be undertaken prior to project initiation:

- Review the facility emergency and contingency plans where applicable.
- Coordinate among the NWC project management team, local emergency responders, and all affected parties to ensure the following are identified:
  - Emergency reporting procedures
  - Notification procedures for all workers onsite that an emergency is taking place
  - Emergency notification means
  - Assembly area(s) for anticipated emergencies (chemical release, fire, severe weather, etc.)
  - Site evacuation routes

Each project's H&S plan will include details of the emergency response plan and notification procedures. The above details will also be posted on all project sites.

2.13.2 Emergency Response

In case of fires, explosions, or chemical releases, specific actions expected will be included in the contractor's specific H&S plans. These may include the following:

- Shut down operations and evacuate the immediate area.
- Notify appropriate response personnel.
- Account for personnel at the designated assembly area(s).
- Assess the need for site evacuation and evacuate the site as warranted.

Note that small fires or spills posing minimal safety or health hazards may be controlled without implementing a work area evacuation. For environmental incidents, refer to Section 4 of this document.

2.13.3 Evacuation Procedures

The following general requirements will be observed in developing the evacuation procedure:

- Evacuation routes and assembly areas will be designated before work begins.
- Personnel will assemble at the assembly area(s) upon hearing the emergency signal for evacuation.
- A designated person will account for all personnel at the assembly area.

2.13.4 Emergency Medical Treatment

Injuries and illnesses (including overexposure to contaminants) are expected be reported to the employee's direct supervisor immediately. If there is doubt about whether medical treatment is necessary, or if the injured person is reluctant to accept medical treatment, contact the designated H&S representative within the employee's organization.

2.13.4.1 Emergency Response Training

The contractor's emergency response plan will be reviewed during employee orientation and occasionally during site safety briefings. The briefings will include:

- Emergency procedures for fires, explosions, chemical and vapor releases, personnel injuries, and suspected overexposure as they apply to the site
- Location of onsite emergency equipment and supplies of clean water
- Local emergency contacts, hospital routes, evacuation routes, and assembly points
- Site communication and location of phone nearest to the site
- Names of onsite personnel trained in first-aid and CPR

It is expected that emergency drills will be performed periodically, but at least once per year (initially within the first 90 days of construction). Upon completion of each drill, an evaluation will be made of the emergency response plan to determine its effectiveness. Any problems or concerns identified during the evaluation will be corrected.

2.13.4.2 Crisis Management

NWC has established a process for planning and responding to emergencies in the NWC Crisis Management Plan.

SECTION 3

Security Program Plan

3.1 Security Program Plan Overview

This section discusses the purpose and use of the Security Program Plan (SPP) in support of the National Western Center Capital Build program and is supported by the NWC Security Primer 2017 in Appendix A. The SPP at NWC is an extension of the Program Management Plan, expanding on the concepts and conditions of the PgMP, and provides the compliance requirements to be followed by all parties working on or visiting the NWC campus. Security responsibilities are limited to the construction zones. The program and the individual projects will coordinate with the operational zone security requirements, as appropriate.

3.1.1 Introduction and Purpose

The purpose of the SPP is to communicate and provide a basic shell of security methodology, approach, and measures aligning and enhancing NWC's overall management approach to the program through continuous analysis, driving security measures to protect NWC construction assets, and describing the interface between the construction and events operations on the campus.

The NWC SPP is intended to accomplish the following objectives:

- Develop approaches and requirements through all stages of the program as described in the PgMP.
- Address approaches, identify strategies, and define requirements for security elements of the NWC Program. The program dictates the communication of those elements to visitors, guests, management, participants, CCD, and the program workforce, including contractors and subcontractors.
- Provide specific steps and tasks to be undertaken to ensure best security management practices are used to meet program schedules, establish emergency processes (crisis management business continuity), avoid cost increases, and provide needed security services.
- Create a variable scope of applicability to include elements of WSSA event security, preconstruction security, public access, pedestrians and parking, and completion-to-occupancy stages.

3.1.2 NWC Security Goals

NWC's Capital Build program security goal is simply this: zero security-related incidents or events that cause major asset losses or jeopardize employee security (Target Zero). All individuals who either work or visit the NWC construction zone are required to proactively engage in a safe and secure working environment.

3.1.3 NWC Security Responsibilities

The NWC security program function follows industry best practices and directly supports the Target Zero concept referenced in Section 2.2.

Security responsibilities include:

- Program emergency management response
  - Crisis management
  - Business continuity

- Facilities and job-site security
- Employee protection
- Program office security
- Reporting

Security at NWC is managed in a team concept. The NWC Program HSSE Manager is the team lead, responsible for the day-to-day management and administration of the SPP, including effective risk management.

3.1.3.1 Program HSSE Assurance Manager

The NWC Program HSSE Assurance Manager is responsible for the oversight of the security aspects of the program and, at a minimum, for the following:

- Directing the implementation and maintenance of the NWC SPP.
- Establishing and communicating security emergency and crisis processes to all parties on the program.
- Implementing security directives and requirements and testing, validating, and assessing security processes where applicable.
- Managing access into the NWC sites as each phase of demolition, remediation, or construction occurs, including storage areas and laydown yards.
- Coordinating additional security activities and needs with emergency response groups.
- Overseeing, as applicable, contract inclusions for the implementation of the SPP.
- Assisting Denver Police Department and Denver Fire Department with investigations of security and asset protection violations and concerns.
- Taking appropriate corrective actions for confirmed security or asset violations.

3.2 Physical Security and Workforce Protection

3.2.1 Personal Conduct - Security

All workforce members, visitors/guests, contractors, subcontractors, and vendors are required to conduct themselves in a manner that complies with NWC security processes or instructions and must report security incidents for mitigation. The security program is strengthened by continuous improvement among all who have contact with, business with, or work at the NWC Program.

3.2.2 Security Policies

3.2.2.1 Emergency Response Guidelines

NWC provides guidelines and instructions for its workforce in response to emergencies such as severe weather, bomb threats, and civil disturbances.

3.2.2.2 No Weapons Policy

No NWC employee, temporary employee, contractor, vendor, or guest/visitor is permitted to carry, introduce, or possess firearms or weapons of any type within the designated construction zones on NWC property. This prohibition includes any items that may be used as a weapon to inflict harm upon personnel or property. Law enforcement and security personnel are exempt from this rule.

Workforce members must report the knowledge of existence of weapons of any type to their supervisor. If the individual possessing or wielding weapons poses an immediate threat to life or imminent danger injury to workforce members, law enforcement (911) must be called.

3.2.3 Access and Site Control

3.2.3.1 Site Logistics and Access Control Planning

Construction logistics have dependencies on the security for the NWC Program, as construction occurs throughout the unsecured 250-acre site. Roads, walkways, and other vehicular and pedestrian thoroughfares to businesses and campus properties are to be securely maintained to the extent possible.

- The Program HSSE Assurance Manager, in conjunction with the Program Manager will establish a program-wide identification process to ensure that all workers onsite are registered, oriented, and provided with an identification (ID) badge.
- The Program HSSE Assurance Manager will provide regular and ongoing training and logistics for working in and adjacent to BNSF Railway, DRIR, and RTD railway rights-of-way.
- The Program HSSE Assurance Manager will integrate existing WSSA security processes for the coordination with ongoing campus operations and adjacent business owners.

3.2.4 Workforce and Personnel Identification Badges

Program workforce, i.e., employees, contractors, subcontractors, suppliers, and guests/visitors are required to wear an ID badge or hard hat sticker when on the construction zones of the program site.

3.2.5 Visitor/Guest Escorting Instructions

There are three basic purposes for escorting: (1) ensure guest/visitor personal security and safety, (2) prevent guests and visitors from unauthorized access to sensitive information, and (3) prevent guests and visitors from access to restricted areas or risky environments.

- All guests/visitors must be escorted during their visit to construction zones of the NWC site.
- Escorts should be knowledgeable of the NWC security and safety processes, office layout, and general operations, as well as safety practices.
- The escort will physically identify evacuation route(s) to be used should an emergency arise affecting the escorted individual, as well as restricted entry areas.
- Escorted individuals must follow established NWC policies, procedures, and safety guidelines and any safety-related instructions of the escort.
- If an escorted individual cannot be located, report the missing individual to the Program Manager.
- Guests/visitors must fill out the Visitor Waiver, shown in Appendix B

3.2.6 Vehicle Controls

As an element of asset protection, vehicles need to be protected and thus controlled appropriately in construction zones of the NWC site.

- Program vehicles will be registered/authorized and vehicle data stored electronically with the PMT to ensure authorization to be present on the NWC program.
- All vehicles on the NWC program will conform to State of Colorado motor vehicle statutes, ensuring safe vehicle operations.

- All drivers of vehicles on the NWC program will have a valid driver's license.
- All vehicles will be locked/secured when not in use, including unattended tools, equipment, and materials, preventing loss/theft or misuse.
- Vehicles may be restricted for entry to hazardous or controlled-entry areas with coordination or direction by the HSSE Manager.
- Each contractor will ensure entry of personal vehicles is strictly controlled by providing clearly identified parking areas.
- Consistent procedures will be developed and communicated for vehicle controls.
- Vehicle control processes must be well understood by the program workforce through security communications/training.
- Where buses are used to transport workforce members, clearly marked stop/pickup points will be created onsite as well as offsite.

3.2.7 Material Control

Materials (construction, building, office, National Western Stock Show [NWSS] materials) are considered assets of the program and must be protected from theft, loss, abuse, or misuse.

- Materials may be inspected, inventoried, and logged for security purposes or suspected security violations.
- Discrepancies in quantity or as-delivered quality will be reported to the PMT.
- Any missing or damaged material will be reported to the PMT. A review will be instituted. If criminal activity is suspected as derived from the review, Denver Police will be contacted.

3.2.8 Pedestrian Controls

Pedestrians have the right-of-way in any public or work environment and will be protected using appropriate controls in the construction zones of the NWC site.

- Pedestrians will be afforded dedicated walkways with limited interference by vehicular traffic per standards for pedestrian controls.
- Clear and concise signage and/or paint striping will be used to direct workforce pedestrians in the safest and most secure path to their work/project areas.
- Pedestrians should remain situationally aware of events surrounding their path to and from the work sites.
- Construction workforce movement will be positively controlled; pedestrian routes onsite, parking and site access points, offsite parking, and busing will all be designed for pedestrian security and safety.

3.2.9 National Western Stock Show Security Planning - Events

The Program HSSE Manager with support from individual project managers will coordinate with NWSS management to identify all upcoming events that may impact project construction and, conversely, project construction that may impact NWSS events, and will identify security mitigation measures that are mutually beneficial. Maintaining and enhancing the reputation of the NWSS is a prime directive of the security program. NWC will be supportive of the NWSS events, yet remain security focused commensurate with NWC security processes/instruction/policy to reduce liability and injury on/to the construction site as well as NWSS participants, attendees, animals, and NWSS workers.

3.2.10 Parking

Workforce parking will be established in areas coordinated and complementary to the construction activity/phase being performed.

- Adequate spaces will be provided per workforce population and construction phasing.
- Americans with Disabilities Act compliant spaces will be developed as close to the work as reasonably possible.
- Visitor/guest parking will be clearly identified and will have an adequate number of spaces.
- Construction parking will be monitored and control points/communications developed to avoid uncontrolled parking spillage into the communities.

3.2.11 Cleared Sites/Areas

Any area within the NWC construction umbrella will undergo a security risk analysis prior to being identified as a "cleared site" for further beneficial use. This beneficial use includes but is not limited to parking, storage/laydown areas, collection points, or contractor use.

3.3 Emergency Preparedness

3.3.1 Crisis Management

The Program HSSE Manager will work with the NWCO Communications team to develop a crisis reporting procedure to mitigate and minimize risks/threats and consequences associated with crisis incidents. The procedure will comply with the crisis communications section of the *NWC Capital Build Program Governance Handbook*. Crisis incidents must be reported and are basically defined as:

- A life-threatening injury or death of an employee, subcontractor, or member of the public
- Kidnapped, held-hostage, unlawfully detained, or missing persons
- Acts or threats of violence or terrorism with critical effects on the program
- Property damage that is estimated to result in greater than estimated $500,000 in damage
- Evacuation due to political unrest, civil disturbance, or a natural or human-caused disaster
- A crisis that may discredit or have a negative impact on the NWC

Crisis incidents, as described above, must be immediately reported to the Program HSSE Manager.

3.3.2 Crisis Management Requirements

To effectively respond to, report, and manage crisis incidents, project managers will develop a crisis management section within their Project Execution Plans for each construction project to complement the unique operating framework at NWC and comply with the Governance Handbook requirements and the HSSE incident and reporting program.

3.3.3 Evacuation

The Program HSSE Manager is responsible for ensuring compliance with any evacuation order, including routine training exercises or drills (fire, civil disturbance, or weather emergency drills).

- The Program HSSE Manager will establish and document primary and alternate assembly (collection) points and conditions for evacuations. Workforce will be provided maps and locations of assembly points.
- Evacuation routes will be evaluated and established, then communicated to the workforce, contractors, guests/visitors, and vendors upon engagement with the program.

- Safe havens (areas to shelter in place) will be evaluated and indicated on maps.
- The Program HSSE Manager will develop workforce member accountability processes for crisis situations.

3.3.4 Business Continuity

3.3.4.1 Purpose

Business continuity (for NWC, WSSA, CSU, and other stakeholders) and the required management process is concerned with identifying threats and vulnerabilities and those parts of the program operations that the program cannot afford to lose, such as information, premises, workforce, or systems, and then planning how to maintain these if an incident occurs. Business continuity is typically implemented in conjunction with or just after crisis management has resolved the original event.

3.3.4.2 Business Continuity

- Serves as a guide for the recovery groups
- References and points to the location of critical data
- Provides procedures and resources needed to assist in recovery
- Identifies personnel that must be notified in the event of a disaster
- Assists in avoiding confusion experienced during a crisis by documenting, testing, and reviewing recovery procedures
- Identifies alternate sources for supplies, resources, and facilities
- Documents storage, safeguarding, and retrieval procedures for vital records

3.3.4.3 Business Continuity Planning

NWC, WSSA, Colorado State University, and other stakeholders are responsible for developing their specific Business Continuity Plan (BCP) affecting their operations. The plan becomes effective when a crisis or human-caused or natural disaster occurs. BCP procedures should be initiated and remain in effect until operations are resumed at the original location or a replacement location and control is returned to the appropriate functional management.

3.3.4.4 Key Components of Business Continuity

The BCP contains the following primary sections:

- Business continuity risk identification (business impact analysis) and tracking – Business impact analysis risk identification is used to identify disruptions that could create inherently abnormal and unstable situations that represent a threat to the completion of construction phases, stages, or reputation of the NWC Program or the program as a whole.
- Key staff/workforce – Succession planning addresses those personnel resources who are deemed operationally critical to the success of the program.
- Information systems continuity – The BCP identifies the business-critical systems and infrastructures, and the recovery procedures.
- Office resources – The plan identifies the office resources needed and the available facilities, both local and remote to NWC, with site information and contact details that could be used by the program. This component may also identify the critical office supplies (tables, desks, chairs) that are needed.

3.4 NWC Security Training

Workforce members, especially supervisors, forepersons, and managers, are critical to completion of any NWC task in a safe and secure manner. The workforce is key to protecting the program vision via knowledge, skills, and information on basic security program processes. Employee training, review, and awareness programs will ensure that workers understand the Security Program Plan, are prepared for any type of incident, and maintain their situational awareness. This training is an essential baseline for mitigation of risks, threats, and vulnerabilities. It will be included in the general HSSE Orientation training for new employees. Refresher training will be used, as appropriate, upon the recommendation of the HSSE assurance manager.

3.5 Security Operational Reporting

Reporting security incidents through developed and documented processes, no matter the severity of the incident, is a keystone of a strong security program. Reporting leads to integration with proper authorities as well as strong investigative processes to develop corrective actions or lessons learned. All workforce members will be encouraged to report security concerns or incidents immediately with no retaliation.

Information about the status and condition of security at NWC is vital to program completion and is required to facilitate risk analysis and appropriate mitigation.

Report types that may be utilized:

- Annual report of security program risks, threats, and vulnerabilities.
- Security incident reports. Security incidents will be evaluated by the Program HSSE Manager and described in a succinct, yet conclusive report.
- ID badge and access cards. Badges and cards issued will be reported monthly. Visitor/guest logs will be maintained daily to create an ongoing record. Lost, missing, and unreturned visitor/guest badges or stolen ID badges will also be reported monthly.
- Daily security report. This report will summarize each day's site security activities including normal operations as well as incidents, contacts, and issues encountered.

3.6 Security Communications

Communications during security-related events at NWC (focused on emergencies and crisis business continuity) will be facilitated through cell phones carried by all by supervisors and managers. Crisis communications will align to the requirements of Section 9 of the *NWC Capital Build Program Governance Handbook*.

- Denver Police District 2 station is located approximately 1 mile southwest of the NWC program site at 3921 Holly Street; 2.Dist@denvergov.org or non-emergency number 720-913-1000.
- Denver Fire Station FS-9 is approximately four blocks south of the NWC program site at 4400 Brighton Boulevard; denfpb@denvergov.org.
- Each NWC participating party will ensure the programming of NWC workforce cell phones (including contractor/subcontractor supervision and management) with critical contacts for the management of crisis events and emergencies.
- Cell phones will be used for daily security operations, to communicate activities, status, and instructions.

- NWC workforce members will be required to monitor their cell phones while onsite for critical information related to safety and security.
- Upon receipt of critical information, contractor supervisors/managers will contact their next critical, core, or key individuals in the “chain of command” under their control, thus continuing communications through the site workforce.

SECTION 4

Environmental Program Plan

4.1 Introduction

The NWC Capital Build Environmental Program (NWC E Program) - in close coordination with the NWC Health, Safety and Security Program - provides service as a program assurance function (as detailed in Sections 1 through 3 of this *HSSE Program Plan*). The core elements of the NWC E Program are to maintain compliance with all applicable laws and regulations, establish organizational processes, identify potential aspects and impacts (including risks) of NWC Program activities, and establish processes to minimize those risks.

The vision for the NWC E Program is to align with the CCD Environmental Policy and to coordinate with health, safety and security to develop an integrated NWC Program HSSE Policy. NWC Program HSSE performance is centered on the Target Zero philosophy, which uses the PDCA methodology, to continually strive for zero incidents, while recognizing that incidents could potentially occur.

The NWC E Program will be implemented based on the best practice of an Environmental Management System (EMS) both at the program-level and for individual projects at the project-level, and to assure alignment with the City's EMS. Projects will implement system elements that operate within the overall NWC E Program. This section is considered the Environmental Program Plan for the NWC Program and Appendix D contains the Project-Level Environmental Program**.** The Project-Level Environmental Program is part of the Environmental Program Plan (Plan).

This Plan is organized in to eight sections to provide clear direction for the reader to use the manual:

- **Introduction:** Provides an overview of the purpose and scope of the NWC E Program.
- **Leadership and Participation:** Describes how leadership contributes to the success of the NWC E Program including at the project-level.
- **Planning:** Summarizes the implementation and operation of the NWC E Program.
- **Implementation and Operation:** Describes how performance will be evaluated and how corrective action will be implemented.
- **Evaluation and Corrective Action:** Describes the methodology for performance monitoring; reporting, investigating, and managing incidents; assessment of the NWC E Program; and corrective and preventative measures.
- **Management Review:** Outlines how often the NWC E Program will be reviewed by management and who has responsibility for those reviews.
- **Definitions:** A list of definitions relevant to the user of this Environmental Program Plan.

Appendix D provides the Project-Level Environmental Program; Appendix E provides the NWC Program List of Significant Environmental Risks.

4.1.1 Purpose

The purpose of this Plan is to provide a systematic framework that consistently implements the NWC E Program, based on International Standards Organization (ISO) 14001:2015 EMS requirements as best practice. The model for the NWC E Program is based on the layers of management system elements as shown in Figure 4-1. Based on this model, the NWC E Program is implemented through a hierarchy of documents.

Figure 4-1. Layers of Management System Implementation

The key phases of the NWC E Program activities are based on the PDCA model as shown in Figure 4-2. To minimize incidents, the PDCA methodology is employed to continuously improve approaches and prevent similar future occurrences, near misses, or environmental incidents while minimizing adverse environmental impacts. (See definitions in the Section Definitions below.) The components of the PDCA methodology are:

Figure 4-2. EMS Delivery Cycle (Plan-Do-Check-Act)

- **Leadership**: Develop and establish an integrated NWC Program HSSE Policy Commitment and environmental objectives based on the strategic direction and purpose of the NWC Program, and the City's Environmental Policy, while building a culture of Target Zero.
- **Planning**: Take elements identified in the City's Environmental Policy, NWC Program HSSE Policy Commitment, the applicable Regeneration of Natural Environments, Energy, Water, and Waste (ReNEWW) goals and regulatory requirements, and determine how objectives will be achieved through the activities undertaken by the NWC Program during project development, design, and contractor execution.
- **Support and Operation**: Execute the planning phase to execute the NWC E Program requirements. Consistent with the NWC Capital Build life-cycle, operational controls will be developed to manage environmental performance consistent with the NWC Program HSSE Policy.
- **Performance Evaluation**: Collect, assesses, and track information to understand the progress of execution and evaluate environmental performance.

- **Improvement**: Check the execution of what was planned and create corrective action and improvement plans as required.

The NWC E Program interacts with many other NWC Program elements and processes as an integrated process. This includes: Quality Management; Project, Portfolio and Program Management; Risk Management; Procurement; Communications; and Health, Safety, and Security.

4.1.2 Scope of the NWC Environmental Program

The NWC Program manages the redevelopment of the NWC with scope defined by the NWC Program baseline. The roles and responsibilities within the NWC Program and subsequent project teams are dependent on the project life cycle. During project development, the NWC Program role is to set expectations and monitor and review to provide assurance that expectations are being delivered. During project execution, both an assurance and execution role ensure project requirements and expectations are met.

Broadly the NWC E Program applies to the following scope items of the NWC Program:

- Remediation of sites identified by the CCD, DDPHE (e.g., urban fill areas) subject to specific environmental compliance requirements.
- Management of contaminated soils and groundwater in accordance with DDPHE Material Management Plans (MMPs).
- DDPHE' s management of unknown and unplanned site conditions during redevelopment work.
- Project/Construction management (vertical development including early work such as demolition, horizontal development including enabling work: infrastructure/utilities, roads and bridges, and design and construction) of the NWC Program.
- Interim property management activities (from demolition until construction is complete),
- Program environmental assurance of the NWC Program activities.

This Plan applies to all NWC Program redevelopment activities with the potential to impact the environment. Every project is expected to implement the requirements in this Plan, where the HSSE Program Plan is included as a contract document.

The scope of the NWC E Program does NOT cover:

- City office space related activities, as these are covered within CCD's existing EMS.
- Land acquisition, conducting environmental site assessments (ESAs) Phase I and Phase II, and the identification of contaminated soils and groundwater, as these activities are carefully managed by DDPHE' s programs and staff, and exist under CCD's existing processes and operations.
- Initial property management activities (i.e., once the land is acquired and prior to demolition), as these are managed by DDPHE programs and staff, and exist under CCD's existing process and operations.
- Any WSSA, the National Western Center Authority (once established), CSU, or any other third-party operations or events on the site (Classified as operation zones), as these operations or events have their own environmental compliance program/requirements.
- Activities in public ROWs as this is controlled by CCD Public Works requirements, except as impacted by contractors performing work on behalf of the Program and in coordination with CCD Public Works, including necessary ROW approvals and controls required by CCD.
- Activities in rail zones as these are strictly controlled by rail authorities.

- Post-NWC Program operation and maintenance activities, once land is handed over to the NWC Authority.

However, during the NWC Program, close coordination will be conducted regarding ongoing WSSA events and operations to assure alignment for handover to construction phase activities under the NWC Program.

4.1.2.1 Master Plan Identified Environmental Issues

Historical activities surrounding the NWC campus have impacted air, water, and land quality, and historically created odors and noise. Consequently, contaminated soils and groundwater may be encountered during redevelopment activities. Key environmental issues are:

- Soils Contamination
- Groundwater Contamination
- Surface Water and Sediment Contamination
- Air Quality (including dust)
- Noise
- Odors
- Natural Environment and Habitat

These issues are identified in the *NWC Environmental Program Risk Register* and in the *NWC Register of Environmental Regulations and Other Requirements*.

4.1.2.2 Regeneration of Natural Environments, Energy, Water, and Waste

The NWC Program's ReNEWW Group has identified specific ReNEWW goals applicable to work conducted during design and construction, which will be implemented using a separate management system. The specific design and construction related ReNEWW goals are provided here for information only:

Key Performance Indicator	Description	Proposed Measure	Target	Driver
Sustainable Site Redevelopment of Energy, Water, Waste, and Natural Environment				
Programmatic Strategy: Align LEED GOLD certification with specific optional credits that support four theme areas				
LEED GOLD +	Develop LEED GOLD strategy to identify optional credits that support four themes	Design milestone review compliance	95% of designs compliant with LEED GOLD+ strategy	EO 123
Water: Create an Inspiring "One Water" District				
Desired Outcome: Deliver the natural system the right water at the right time: maximize landscape and green infrastructure in support of water, stormwater, stream health, and enhanced resilience to extreme weather				
Effective impervious area	Support overall site water quality	Sq. ft. impervious/total sq. ft.	TBD after placemaking	CCD Ultra Urban Green Infrastructure Guideline; Urban Drainage and Flood Control Manual
Natural Environment: Create a campus that encourages visitors to engage with the natural environment				
Desired Outcome: Thriving urban ecosystem that enhances the relationship between people and nature				
Tree canopy	Existing tree canopy of capital build acreage	Per CCD	TBD based on benchmark/treatment of invasive tree removal	CCD EO 123 Ch. 8: Tree protect—maintain Denver's 19% coverage

Key Performance Indicator	Description	Proposed Measure	Target	Driver
Desired Outcome: Improve the current state of the riverfront				
Eliminate invasive species	First step to improve habitat	Restored acreage for what we touch-Baseline invasive species acreage	90% improved acreage invasive species removal	Industry best practice
Desired Outcome: Design materials to be avoided and which inhibit ReNEWW; or that are preferred and which enhance ReNEWW				
Material selection	Evidence of red, amber, green list items used in design	Number of red items used in design versus number of green items. Assurance report from CCD Office of Sustainability of meeting intent of EO 123 Chapters 2 and 5	0 red items; TBD green items	CCD EO 123 Ch. 5: Materials and Waste Management Memorandum 123-D; concrete-specific requirement per EO 123
Waste: Move towards Zero waste campus – leading by example				
Desired Outcome: Minimize disposal to landfill during demolition				
Demolition waste diversion	Allowable demolition waste reuse, recycling, and deconstruction	Weight of repurposed material/total weight and volume of demo material	90%	EO 123 Ch. 5 *Already included in demo procurement
Desired Outcome: Minimize waste generation on site during construction				
Construction waste diversion	Allowable construction waste diversion	Lb. of waste recycled/lb. of total waste	50%	EO 123 Ch. 5

Other portions of ReNEWW are addressed separately as part of the overall NWC Program. The ReNEWW Group, steward's sustainability efforts to meet CCD's Executive Order 123 and uphold the sustainability vision detailed in the NWC Master Plan. They coordinate implementation strategies across projects to align sustainability/ReNEWW goals for the NWC Program.

4.1.2.3 Contractors Environmental Performance Standard

Contractor expectations and performance standards are described in Appendix D.

4.1.2.4 Changing Site Activities

See Section 1.1 of the *HSSE Program Plan* for a full description of changing site activities.

4.1.3 Third-Party Entities

NWC third-party entities, the WSSA and CSU are solely responsible for the environmental performance of their contractors, workers, and subcontractors and adequacy of their actions in complying with applicable environmental regulations. Third-party entities are required to implement effective environmental incident prevention programs including enforcement and corrective actions.

This Plan is not intended to replace any equity partner, third-party entity or contractor environmental programs, environmental management, or protection plans; environmental regulatory required permits and compliance plans, policies, standards, or procedures; but contains a framework into which individual entities are requested to work under while performing work for the NWC Program.

Third-party entities are requested to specify requirements for implementation of environmentally sound work practices consistent with this Plan. At a minimum, third-party entities are requested to identify

Significant E Risks/Opportunities and Targets (Appendix E), for projects with multiple significant environmental risks, to identify a Project Environmental Manager, ensure their contractors have an Environmental Compliance Manager, and require reporting all environmental incidents, near misses and community complaints to NWC consistent with this HSSE program plan (Section 3.4). Third-party entities are also requested to conserve energy and natural resources (air, water and waste) consistent with the City's Environmental Policy.

4.2 Leadership and Participation

Through Executive Order 141, Denver Mayor Michael Hancock created the Office of the National Western Center (NWCO) to implement the policy of CCD with respect to the vision outlined in the NWCO Master Plan, per Ordinance No. 2015-0091 (March 2015). The NWCO is charged with managing the NWC Capital Build Program on behalf of CCD and the other equity partners.

NWCO senior management, employees, staff, and worker participation are crucial for the success of the NWC E Program and achieving Target Zero.

4.2.1 Management and Leadership

Environmental leadership begins with senior management establishing the expectation to achieve world-class HSSE performance and for integrating this Plan into the fabric of how the NWC Program operates, while demonstrating the value of a Target Zero culture as part of the way the NWC Program will perform work.

4.2.1.1 City and County of Denver Environmental Policy

The CCD Environmental Policy (Figure 4-3) provides the guiding principles and commitment to environmental excellence consistent with ISO 14001 requirements. To integrate health, safety, security and environmental assurance, the NWC Program has executed a supplemental and integrated NWC Program HSSE Policy commitment statement that aligns with CCD's Environmental Policy.

4.2.1.2 NWC Program HSSE Policy Commitment

The NWC Program has created the SHELT to oversee HSSE for the NWC Program. SHELT has documented, published, and communicated a clear NWC Program HSSE Policy Commitment. (See Section 1 of *HSSE Program Plan*.)

ENVIRONMENTAL POLICY

The City and County of Denver (CCD) is dedicated to working with our partners towards an environmentally, economically, and socially strong future. Our organization and employees are committed to sound business practices, policies, actions, and programs that enhance environmental performance by:

- Protecting the environment
- Conserving energy and natural resources
- Preventing pollution
- Meeting or exceeding all compliance obligations and voluntary commitments
- Continually improving the Environmental Management System (EMS)

This policy shall be communicated to all employees, individuals working on behalf of or under the direction of CCD or one of its agencies, and others operating on CCD premises. Each is accountable for following this policy and reporting any environmental, health, or safety concern to the Mayor's Office or to management of the applicable CCD agency.

Mayor Michael B. Hancock

Date: 10/12/2017

DENVER
THE MILE HIGH CITY

Figure 4-3. CCD Environmental Policy

4.2.2 Program and Project Employee Participation

The NWC Program and project employees, staff, and workers are responsible for conducting work in an environmentally responsible manner by implementing CCD Environmental Policy and the NWC Program HSSE Policy Commitment, and actively using good practices and behaviors on projects that include implementing this Plan, and complying with the standards, practices, guidance and training identified in this plan.

NWC Program and project employees, staff, and workers are expected to provide specific input regarding suggestions or ideas to continually improve the NWC E program.

The NWC Program believes that all environmental incidents are preventable and is dedicated to Target Zero. To achieve this goal, all employees, staff, and workers on a project must assume responsibility for protecting the environment and are therefore empowered to:

- Conduct work as environmental stewards, including work practices that prevent impacts or pollution to the environment for any activities performed.
- Stop work immediately to correct any condition that could impact the environment, with the knowledge that those involved will positively respond to a concern raised.

- Take appropriate corrective actions before recommencing work so that work may proceed in a manner protective of the environment.

It is the expectation that all employees, staff, workers, contractors, subcontractors and visitors to the NWC Program construction zones will:

- Prevent pollution and maintain environmental compliant projects.
- Comply with environmental policies and training requirements.
- Be aware of potential environmental impacts to other project sites, neighbors, surface water, storm drains, trees with possible nesting birds, and any wildlife that surrounds the NWC campus.
- Report work conditions and actions that could negatively impact the environment.
- Report all environmental incidents, including near-misses.
- Minimize waste and reuse or recycle whenever possible.
- Conserve energy and natural resources (air and water quality).

4.3 Planning

Effective planning results in an organized approach to implementing the NWC E Program. The NWC Program has developed a robust approach for all program and project decision making that allows for implementation of this Plan in a consistent manner while allowing for ongoing assessment and adjustment as needed to assure continual improvement in environmental performance.

4.3.1 Organization

The NWC Program has a phased project management approach for demolition, design, and construction that produces fact-based decisions using a set of defined evaluation criteria. It allows for appropriate management review of projects within the NWC Program to approve progression and determine readiness for a project to progress to the next phase of work. The PMT developed this review approach and project managers implement the Project Stage Gate review process and ensures each project is aligned with the NWC Program HSSE Policy (per *NWC Program Governance Handbook*). The Project Stage Gates are:

1. Initiate Project
2. Procure Design
3. Begin Design
4. Issue Request for Proposal
5. Contract Award and 5a: Construction Start on Site
6. Substantial Completion
7. Final Acceptance
8. Project Closeout

In general, the following NWC projects, in whole or as parts, have been identified as:

- Early Demolition Work
- Demolition
- Enabling Works
- Site-wide Infrastructure (including Utilities, Roads, Bridges and Tunnels)
- Riverfront Open Space
- Livestock Center
- Equestrian Center
- Stockyards Events Center

- CSU-Owned Water Resources Center, and CSU Animal Health Facility Pad Site
- Parking Garage
- Maintenance & Operations Building

4.3.2 Initial and Ongoing Reviews

The NWC Program will initially and annually evaluate their progress in implementing this Plan using the *Environmental Program and Project Assessment Practice Checklists*. An action plan will be developed for the identified gaps in NWC Program implementation. Annual reviews are conducted as described in Section 6.0 Management Review by a member of SHELT or an independent entity as identified by SHELT.

4.3.3 Assessment and Prioritization

NWC E Program risks are based on the activities conducted by the NWC Program based on their task order requirements, and changes in legal and regulatory requirements.

4.3.3.1 Environmental Risk-Aspects and Impacts

The *NWC Environmental Program Risk Register* was developed to identify NWC Program activities and any associated environmental aspects and impacts associated (or risks) with those activities. Risks are then evaluated in terms of significance, and appropriate controls and mitigation measures are identified.

A summary of the *NWC E Program's Significant Environmental Risks* are included in Appendix E.

4.3.4 Legal, Regulatory and Other Requirements

Legal, Regulatory, Policy and CCD Executive Orders (EO) associated with the NWC Program are identified in the *NWC Register of Environmental Regulations and Other Requirements*.

This *NWC Register of Environmental Regulations and Other Requirements* focuses on potential environmental regulatory and other requirements applicable to the NWC Program activities. This register is not intended to replace or identify all federal, state and local environmental rules, laws and regulations; and is provided as a guide only. The *NWC Register of Environmental Regulations and Other Requirements* does not eliminate the requirement for projects or contractors to identify, develop, and document permits, legal, regulatory, and other requirements associated with their scope of work. The *NWC Register of Environmental Regulations and Other Requirements* document is made available to all projects and contractors as guidance in drafting their own list of environmental rules, laws, regulations, and other requirements.

4.3.4.1 Environmental Permits

Environmental permits associated with the NWC Program are identified in the *NWC Register of Environmental Permits*. This register is not intended to replace or identify all federal, state and local required environmental permits; and is provided as a guide only. This permit register does not eliminate the requirements for designers, construction managers, projects or contractors to identify, obtain and implement the legally required permits associated with their scope of work. The *NWC Register of Environmental Permits* is made available to all designers, projects and contractors as guidance in identifying their own list of required permits.

4.3.5 Environmental Objectives, Targets, and KPIs

The goal of the NWC E Program is to achieve Target Zero environmental performance consistent with an integrated HSSE program. Table 4-1 summarizes the NWC E Program's desired outcomes, strategies for achieving those outcomes, KPIs, PIs, and Targets.

Table 4-1. Environmental KPIs and Targets

Desired Outcome (Objective)	Strategies	Key Performance Indicators (KPIs)	Performance Indicators (PIs)	Targets
Regulatory Compliance, No Serious Environmental Impacts and Minimized Complaints	Environmental Program and Project-Level Environmental Requirements Environmental risk, regulation, and permit registers. Contractor Environmental Performance Standard KPIs and PIs Regulatory Agency Inspection Practice Incident Reporting, Investigation and Response Environmental Design Standard Material Management Plans	Environmental Compliance Incidents	Immediate notification of Incidents Incident Investigation & Corrective Action Report within 7 days Monthly-# and type of Agency inspections Monthly-All agency issued warning, advisory, notification, issue, non-compliance, Notice of Violation (NOV), fine or penalty. $ Enforcement Penalty All near misses 100% Workers Have Environmental Awareness and Compliance Training (# of Workers and # of Workers Trained-evidenced based Training Records) All Complaints (by type and date of complaint) Time Frame to Respond Time Frame to Resolve Actions to Prevent Reoccurrence	Zero Enforcement Actions (resulting in fines or penalties)
	Contractor Environmental Performance Standard KPIs and PIs Incident Reporting, Investigation and Response Spill Reporting Practice Contractor Required Environmental Protection Plan	Reportable Spills/Releases	All Spill or Releases Spill/Releases with Reportable Quantity exceeded (type and quantity) # of Agency Reportable spill/releases (type and quantity) All Near Misses Quantity of HM (including petroleum) Stored Onsite	Zero Agency (State or Federal)-Reportable Spills/Releases

Table 4-1. Environmental KPIs and Targets

Desired Outcome (Objective)	Strategies	Key Performance Indicators (KPIs)	Performance Indicators (PIs)	Targets
Conserve Energy and Natural Resources (Air, Water, and Waste)	Compliance with existing CCD Sustainability/EMS Practices for energy, air, water and waste. Align with ReNEWW Desired Outcomes and Targets Contractor Environmental Performance Standard KPIs and Progress Indicators Contractor Required Environmental Protection Plan	Energy Efficiency Water Use Air Quality Construction Waste	Baseline Estimate for each resource Used Quantity of Fuel (gallons), electricity (kWh) and cost ($) Documented Methods Used for Energy Efficiency, Quarterly Used Quantity of Potable vs. Non-Potable Water (gallons) Number of dust related complaints; documented methods to improve air quality including monitoring results to demonstrate compliance (e.g., opacity measurements) Total Quantity of Waste vs. Quantity of Waste Diverted from Landfill (pounds)	Measurable Evidence of Energy Efficiency, Quarterly Minimized Potable Water Use Minimized Air Emissions 50% of Construction Waste Diverted from Landfill

Note: The shaded row indicates KPIs that were not included in the NWC Program's Performance Management Framework approved by PAT and SteerCom for Performance Reporting. However, they are critical to monitoring overall environmental performance and aligning with CCD's Environmental Policy. As such, they are included in this plan and required for projects and contractors to report on monthly, unless otherwise specified.

All projects are to strive to meet the ***ALL*** objectives, targets, and KPIs of the NWC E Program. These objectives allow the NWC Program to stay focused on protecting the public and the environment.

Project managers are responsible for reporting performance against these KPIs based on contractor monthly PI and KPI reporting requirements, and cascading down to the contractor the expectations of this Environmental Program Plan, including compliance with the Contractor Environmental Performance Standard (Appendix D).

4.4 Implementation and Operation

This section describes how the NWC E Program will be implemented and operated using this Plan. This section:

- Defines and communicates roles, responsibilities, and authorities necessary to establish, implement and maintain the Environmental Program Plan and the Project-Level Environmental Program (Appendix D).
- Communicates CCD's Environmental Policy and the NWC HSSE Policy Commitment, and NWC E Program Targets and Objectives to employees, staff, workers, and contractors.
- Identifies and describes operational elements of this Plan.
- Describes how documents and records will be maintained and controlled.
- Describes the training necessary to implement this Plan.
- Describes an effective emergency preparedness and response plan for the NWC Program.

4.4.1 Environmental Program Responsibilities Summary

Figure 4-4 provides a summary of the overall NWC E Program responsibilities for implementing this Plan.

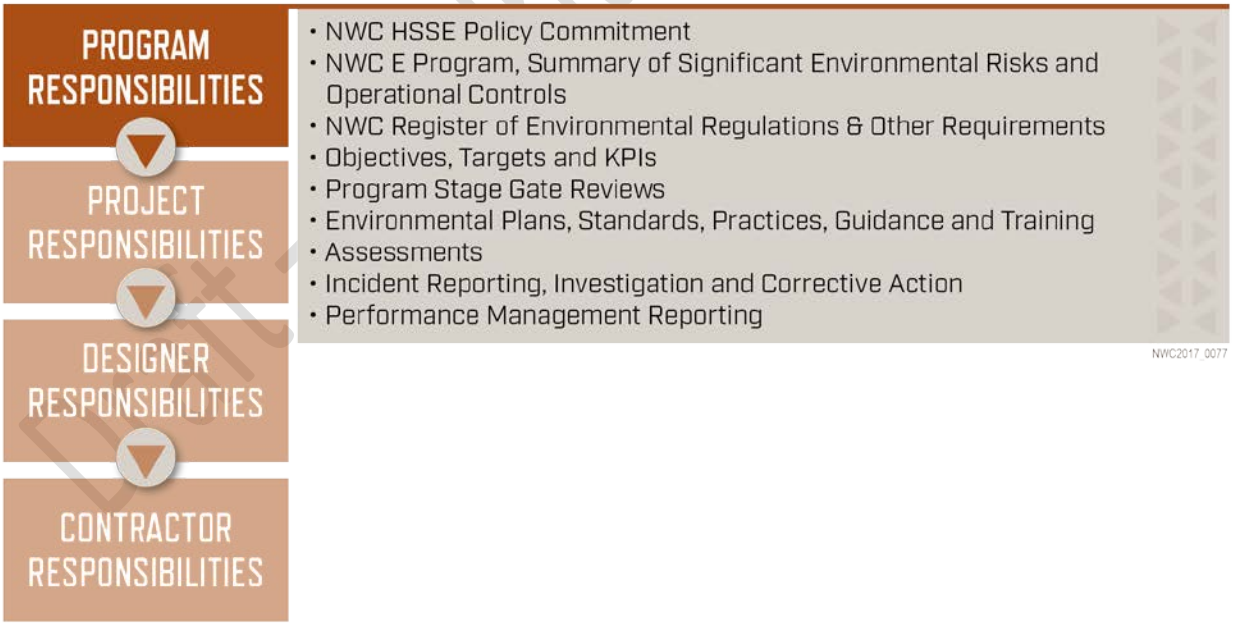


Figure 4-4. NWC E Program Responsibilities

A summary of project and contractor responsibilities for compliance with Project-Level Environmental Program is provided in Appendix D.

4.4.2 Roles, Responsibility and Authority

4.4.2.1 Office of the National Western Center

NWCO is responsible for delivery of the overall program and coordination as applicable with relevant city, state and federal agencies. NWCO makes environmental decisions in compliance with applicable local, state, and federal laws and are consistent with the overall NWC Program delivery strategy.

4.4.2.2 NWC Program Senior Leadership

The NWCO Program Director, NWC Program Manager, and the Horizontal and Vertical Portfolio Managers are responsible for demonstrating leadership and commitment to the Environmental Program Plan as well as providing senior management for the NWC Program. These responsibilities include:

- Develop and implement a NWC Program HSSE Policy Commitment that emphasizes Target Zero HSSE performance.
- Establish KPIs to measure success against NWC Program goals, which includes HSSE KPIs and includes performance metrics in routine performance reporting.
- Establishes and communicates environmental implementation and performance expectations to project teams.
- Establishes and maintains SHELT.
- Commits NWC Program resources required to meet environmental performance expectations.
- Participates in NWC Program-wide environmental communications.
- Reviews the NWC E Program for continual improvement.

4.4.2.3 NWC Portfolio Managers

NWC Portfolio Managers are responsible for assuring the overall implementation of the NWC E Program across their design, construction and/or project management teams, demonstrating leadership and commitment in the NWC E Program, establishing environmental expectations, and leading the effective implementation of the NWC E Program.

NWC Design Managers

NWC Design Managers are responsible for assuring the overall implementation of the Environmental Design Standard (section 4.4.3.5) across their Design Teams, demonstrating leadership and commitment to the NWC E Program. NWC Design Managers are responsible to ensure their Design Teams are aware of and comply with the Environmental Design Standard, and to review or identify an applicable Environmental Manager or Subject Matter Expert to review design submittals to assure compliance with the Environmental Design Standard.

NWC Program SHELT

The NWC Program *Governance Handbook* designates SHELT as the sponsor for the HSSE Program. This team is chaired by the NWC Program Manager.

SHELT provides a NWC Program coordination platform for all HSSE information sharing and progress update between the management teams across the NWC Program and related infrastructure projects. SHELT addresses NWC Program HSSE concerns; approves HSSE standards, practices, tools, and training; and makes decisions within delegated limits of authority. SHELT reports to the PAT.

SHELT has designated a health and safety and environmental assurance managers for the NWC Program to oversee the implementation of the NWC *HSSE Program Plan*. SHELT will maintain adequate resources

to comply with programmatic and common area HSSE requirements. Each project will comply with this Plan and will be responsible for coordination with SHELT.

NWC Program Environmental Manager

The NWC Program Environmental Manager is responsible for:

- Maintain this Plan, including the Project-Level Environmental requirements (Appendix D) and act as a key point of contact to the project teams to help assure projects and tasks comply with the requirements of this Plan.
- Develop, routinely review and update NWC Environmental Program Risk Register, Significant Environmental Risks, NWC Register of Environmental Regulations & Other Requirements, and NWC Register of Environmental Permits.
- Develop, routinely review and update as necessary, NWC E Program standards, practices, guidance and training.
- Assist management in routinely assessing the NWC E Program; and routinely assess project compliance with Project-Level Environmental requirements.
- Work with projects to determine the need to conduct contractor assessments.
- Participate in the investigation of environmental incidents or violations, and identification of corrective actions.
- Monitor and report on NWC Program environmental performance, including monitoring of incident reporting, investigation and corrective actions.
- Prepare and deliver environmental performance reports to NWC Program and CCD (frequency determined by NWC Program and CCD).
- Liaise with the NWC Program Communications; Health, Safety, and Security; and Portfolio Managers.
- Act as a bridge between the strategy and project management teams and act as the day-to-day contact for both NWC and DDPHE delivery staff.
- Work with DDPHE regulatory staff on overall environmental management of regulatory compliance during construction.
- Act as the point of contact with NWCO Communications to support messaging and response to complaints.
- Work with the strategy team to support development of delivery strategies and identify potential impacts of regulatory issues on construction.

4.4.2.4 City and County of Denver/Denver Department of Public Health and the Environment

CCD/DDPHE holds all compliance authority under laws and regulations applicable to the City. Specifically, DDPHE also provides environmental risk management for land acquired by CCD, as part of the NWC Program. This includes performing ESAs to determine if the land being acquired is contaminated, managing the CCD's liabilities as landowner. including the DDPHE also oversees the investigation and management of contaminated soil and groundwater, prior to and during NWC redevelopment projects, including management of unknown or unplanned site conditions and the development of MMPs for NWC project management teams.

CCD/DDPHE Manager of Land Use and Planning, is responsible to:

- Provide environmental technical subject matter experts (SMEs) to support NWC portfolio managers and project managers, as needed.
- Provide projects with a DDPHE SME as the project's point of contact for managing unknown and unplanned site conditions.
- Provide assurance and advice to the NWC Portfolio Managers and project management teams regarding compliance with CCD Policies, Executive Orders, Procedures, and Regulations.
- Identify and mitigate environmental issues and risk with an impact on the ability to deliver the NWC Program.
- Manage environmental regulatory stakeholders (e.g., Colorado Department of Public Health and Environment [CDPHE]; Colorado Department of Labor and Employment, Division of Oil and Public Safety; Colorado Division of Natural Resources; Environmental Protection Agency, etc.)
- Provide strategy input, especially lessons learned from wider CCD experience and using SME expertise to support the NWC Program.

4.4.2.5 Strategy Team (DDPHE and NWCO)

The Strategy Team is responsible for:

- Developing and recommending environmental strategies for implementing scope, schedule, and costs in line with NWC Program requirements, including policy and strategic direction.
- Developing a regulatory and stakeholder strategy.
- Providing environmental directions to project management and delivery teams.
- Managing and reporting performance monthly via the Program Manager to the PAT.
- Managing risks, issues, and decisions for escalation to support the delivery schedule.

4.4.2.6 NWC Construction Managers

Construction Managers, as contracted, are responsible to:

- Have an Environmental Compliance Manager.
- Develop an Environmental Program Plan, to assure alignment with and implementation of this Plan, including project-level environmental requirements (or implement this Plan).
- Take NWC Environmental Awareness Training and develop Environmental and Compliance Awareness Training Program for projects.
- Coordinate with Design Managers and/or Designers regarding environmental design specifications including required environmental permits.
- Maintain an Environmental Permit Log
- Identify, obtain and implement site-wide environmental permits (e.g., city and state stormwater permits and state air permits associated with larger common area of developments) for all work to be performed within their scope of work on NWC campus; including tracking of permit transfers to contractors, for specific land areas under contractor operational control, and including to non-contract related builders.

4.4.2.7 NWC Project Managers

Project managers (including CCD, NWC Program, contracted, and contractor project managers) are responsible to:

- Assure implementation of the Project-Level Environmental Program (Appendix D) and that contractors comply with the Contractor Environmental Performance Standard (Appendix D).
- Ensure a written environmental section is included in the Project Execution and/or Management Plan, identifying significant environmental risks, required permits, applicable risk mitigation measures and commitment statement to Target Zero.
- Ensure applicable environmental permits and associated compliance plans are prepared and implemented by contractors, before they perform work.
- Assure contractors are aware of, understand and comply with the Contractor Environmental Performance Standard.
- Assure flow down of Contractor Environmental Performance Standard and Project-Level Environmental Program to contractors and the supply chain, by attaching a copy of the *HSSE Program Plan* and a copy of the applicable MMP, to procurement/contracts.
- Identify a DDPHE SME as the project's point of contact for managing unknown and unplanned site conditions during any invasive and/or excavation type work, if applicable. Includes the SME as part of the project team and ensures their overall environmental compliance review of the project scope of work prior to conducting field work.
- Identify a Project Environmental Manager as part of the project team, when multiple environmental risks are identified. The Project Manager assumes the role and responsibilities of the Project Environmental Manager, if one is not identified for the project. CCD project managers are to utilize and follow existing public works process for engaging a DDPHE Project Environmental Manager or environmental subject matter expert.
- If implementing a DDPHE developed MMP, hire a third-party MMP Supervisor to ensure compliance with DDPHE MMP, and consistent with the MMP.
- Monitor and report performance against KPIs based on contractor monthly PIs reporting, and enter into the NWC Capital Integration System (CIS) or other tracking tool.
- Notify the NWC Program Environmental Manager regarding contractor environmental incidents.
- Coordinate work with other applicable NWC project managers to reflect consistent assignment of environmental responsibilities, and evaluate and mitigate potential cumulative environmental impacts.
- Take NWC Environmental Awareness Training.
- Comply with NWC E Program plans, standards, practices, guidance, and training.
- Cooperate with DDPHE regulatory staff when they conduct compliance inspections based on applicable laws, regulations, ordinances, CCD policies, and Executive Orders.
- Review contractor environmental incidents and monitor implementation of applicable corrective and preventative actions.
- Participate in monthly SHELT meetings, including participation by contractors responsible for environmental compliance.
- Maintain environmental records in project files.

4.4.2.8 Project Environmental Manager

The Project Environmental Manager is responsible to:

- Coordinate with DDPHE in its role as lead regulator for CCD compliance programs.
- Coordinate with the Project Manager to verify that the appropriate schedules, and budget are in place to achieve environmental compliance and minimize environmental risks.
- Review project scope of work and Identify environmental requirements (e.g., regulations, permits, significant environmental risks, and applicable compliance assurance measures) for inclusion in the Project Execution Plan and procurement/contracts.
- Review contractor compliance with the Contractor Environmental Performance Standard.
- Review Contractor Environmental Protection Plans (EPPs) for compliance with Contractor Environmental Performance Standard and Appendix D.
- Determine and recommend project staff and/or contractors that require environmental training based on proposed activities and staff that would benefit from taking Environmental Awareness Training.
- Review/assess contractor performance based on reporting of PIs and KPIs for overall KPI monitoring and reporting, and conduct an environmental assessment, as applicable.
- Ensure contractor environmental incidents are reported, investigated and managed to prevent recurrence.
- Provide services to support, provide guidance and/or recommendations to the contractors, until completion of project work.
- Routinely assess project conformance with Project-Level Environmental Program.
- Meet quarterly (or if requested monthly) with NWC Program Environmental Manager to status environmental performance, discuss contractor incidents and near misses and share lessons learned.

4.4.3 Operational Elements

This section describes the standards, practices, and tools for implementation of the Environmental Program Plan. Deviation from implementing operational elements requires approval and authorization from NWC Program Senior Leadership.

4.4.3.1 Risk and Compliance Management

Section 4.3.3 outlines the planning and NWC E Program significant risks are based on the activities conducted by the NWC Program; which includes tools for projects to use in identifying project level environmental risks; and environmental regulations and other requirements, including permits.

Appendix D provides the Project-Level Environmental Program for projects to implement and Appendix E provides a site-wide list of significant environmental risks for projects to consider.

4.4.3.2 Material Management Plans

DDPHE has developed an interim, project-specific, and site-wide MMPs to address handling and disposal of contaminated materials and other suspect materials that may be encountered during subsurface redevelopment activities. These MMPs are considered program level environmental plans and form a critical part of the NWC E Program.

4.4.3.3 Initial Environmental Reviews and DDPHE Engagement

Portfolio managers and/or a construction managers are to identify projects with significant environmental risks as early as possible to ensure initial environmental reviews are conducted, to identify environmental project management requirements, including compliance assurance measures for incorporation into procurement and contracts, and to meet with the applicable DDPHE subject matter experts to discuss and provide input into the projects including procurement and contract review, and determine the need for DDPHE project-specific oversight.

4.4.3.4 Procurement and Contracts

Portfolio Managers, Design Managers and/or Construction Managers are responsible to have environmental reviews of procurement and/or contract documents by the Program Environmental Manager and/or DDPHE to identify applicable compliance assurance measures. In addition, Portfolio Managers, Design Managers and/or Construction Managers are to assure the flow down this Plan and Project-Level Environmental Program requirements to project managers and contractors by including a copy of the *HSSE Program Plan* and applicable MMPs as contract documents. Contractors must comply with the Contractor Environmental Performance Standard (Appendix D) and the requirements in the applicable MMP.

The CCD Department of Aviation, Department of Public Works *Standard Specifications for Construction General Contract Conditions*, 2011 Edition, (i.e., Construction Contract General Conditions), requires contractors to comply with General Conditions 806-809 regarding environmental requirements.

4.4.3.5 Environmental Standards

Environmental Design Standard

NWC Design scopes of work shall include expectations to align with the NWC E Program and perform the following:

- Reduce environmental risks through careful consideration of environmental impacts that may be present during construction, identify environmental opportunities and develop an Environmental Design Specifications to minimize risks and maximize opportunities.
- Identify applicable environmental laws, regulations and city ordinances in an Environmental Design Specification.
- Identify Environmental Design Specifications to mitigate cumulative impacts during construction (from other surrounding NWC projects); to minimize groundwater contamination migration during construction; and to minimize waste generation during construction, where at least 50 percent of construction waste is diverted from the landfill.
- Develop an Environmental Permit Design Specification that identifies applicable permits required by the work and who is responsible for obtaining.
- Identify Environmental Design Specifications associated with energy efficiency, reduced potable water use, reduced air emissions and waste diverted from a landfill, during construction.
- Consideration shall be given to identifying methods/requirements for contractors to purchase materials or products that don't use or limits excessive packaging that is brought to the NWC campus.

Contractor Environmental Performance Standard

See Appendix D for the Contractor Environmental Performance Standard.

4.4.3.6 Environmental Practices

The NWC E Program has developed several environmental practices for activities common to more than one site or area on the NWC Program. Projects are required to implement these practices and include:

- *Environmental Program and Project Assessment Practice Checklists*
- *Corrective Action Notice (CAN) Worksheet*
- *Regulatory Agency Communication Inspection Practice* (to be developed in coordination with DDPHE)
- *Coordinated Community Complaints Management Practice* (to be developed in coordination with DDPHE)
- *Agency Spill Reporting Practice* (DDPHE's existing practice and form, or a coordinated practice developed with DDPHE)

4.4.4 Environmental Guidance

4.4.4.1 Guidance for Soil Reuse

DDPHE has developed a memorandum on *Guidance for Reuse of Soil on City Projects* and is applicable to the NWC Program. Projects are encouraged to use this guidance to help minimize waste transportation and disposal costs, and vehicle emissions for worked performed on the NWC Program.

4.4.4.2 Summary of PCE Groundwater Plume

DDPHE has developed a memorandum summarizing the PCE Groundwater Plume and is applicable to NWC Program. Projects are encouraged to use this guidance in understanding the location and risks associated with this contamination.

4.4.4.3 NWC Energy Efficient Construction Guidance

NWC has developed guidance for projects and contractors to consider regarding energy-efficient methods to consider and implement during construction.

4.4.5 Training, Awareness and Education

An NWC Program HSSE site access/onboarding training has been created and is routinely updated based on changes to site conditions, regulations, and NWC Program requirements. Training is required for all employees, staff, workers, visitors, and third parties who will access the NWC site, and receive a site access badge.

Project managers are required to take NWC Environmental Awareness Training, which emphasizes the policy and objectives, significant environmental risks, and the tools and processes established to assist them in implementing the Environmental Program Plan. Completion of the training course results in a sticker to attach to their site access badge to verify completion. Project managers may identify any other members of their project team including contractors who would benefit by taking this training.

DDPHE is in the process of developing Regulated Asbestos Contaminated Soil (RACS) contractor required training. Training will be available in December 2017 and project managers are required to specify this training in contract/procurement documents and evidence of certification requirements from all onsite contractors prior to performing work onsite.

Training records will not be maintained or documented, as each training program identified above results in the issuance of a badge, sticker or certification, in lieu of maintaining training records. However, the NWC E Program will track the number of project managers who have taken the training.

4.4.6 Internal and External Communication

See Section 1.2.1 for HSSE internal and external communication.

Key messages of the NWC E Program communication are:

- Be an Environmental Steward by being aware of your surroundings, know how your work may impact the environment and prevent pollution.
- Environmental compliance is a prerequisite before beginning a project and in performing any work or task.
- Plan your work, conduct your work, review your work, and modify how you do your work to achieve Target Zero with no negative environmental impact.
- Report all incidents and near misses.
- Every community complaint or comment is an opportunity to be a good neighbor.
- Conserve Energy and Natural Resources (Air, Water and Waste).

4.4.7 Document and Record Control

The NWC E Program documents are maintained on the NWC SharePoint site, which includes standards, practices, guidance, tools, and forms. These documents have revision numbers and a version history stored on SharePoint so employees and staff can verify that they have the most recent version. In addition, a version control record is included as the first page of each document to record changes and approvals in the document life cycle. An NWC Document Control process is documented in the NWC Program Quality Management Plan. NWC records are also managed in accordance with the NWC Program Quality Management Plan.

4.4.8 Emergency Preparedness and Response

4.4.8.1 Incident Reporting

Incident reporting of HSSE incidents, including near misses is included in Section 2.12 of the *HSSE Program Plan*. Guidance on spill reporting is included in the *Agency Spill Reporting Practice.* Incidents will be managed and tracked in the NWC CIS.

In the event of a regulatory agency inspection, the process described in the *Regulatory Agency Inspection Practice* must be followed.

4.4.8.2 Emergency Preparedness

Emergency preparedness, planning, and response is included in Section 2.13 of the *HSSE Program Plan*.

4.4.8.3 Crisis Management

NWC has established a process for planning and responding to emergencies in the *NWC Crisis Management Plan*.

4.5 Evaluation and Corrective Action

Effective implementation of this Plan must be periodically checked and if necessary corrective/preventative action is taken to assure continued environmental performance.

4.5.1 Performance Monitoring and Measurement

Monitoring, measuring, and reporting against predetermined performance criteria provides a method for the continual assessment of progress. To monitor the progress associated with the NWC E Program implementation, KPIs have been identified and projects/contractors report on them monthly. KPIs and Incidents are tracked in the NWC CIS.

NWC E Program assessment, performance (KPIs), and incidents are compiled, evaluated, tracked, resolved, and incorporated into the ongoing NWC E Program continual improvement process. This information is communicated to NWC employees and staff in periodic performance reports and in lessons learned.

4.5.2 Incident Reporting, Investigation, and Management

Incident definition, reporting, investigation and management of HSSE incidents, including near misses, is included in Section 2.12 of the *HSSE Program Plan*. Guidance on spill reporting is included in the *Agency Spill Reporting Practice*.

4.5.3 Assessments

Environmental assessments evaluate NWC Program activities for compliance with NWC Program implementation, and suitability and effectiveness to achieve the NWC E Program targets and objectives (Section 3.4). All assessments are tracked in the NWC CIS.

- *Environmental Program Plan and Project-Level Environmental Program Assessment Checklists* focus on the overall functioning of the NWC E Program. Program Assessments are performed by senior leadership and project assessments are performed by program managers or the Program Environmental Manager. The status and progress for implementing the Environmental Program Plan and Project-Level Environmental Program is documented in the assessment checklist*s*. These assessments are performed initially and then annually thereafter.
- Contractor assessments are conducted by the Project Manager or the Project Environmental Manager initially to assess each contractor's conformance with the Contractor Environmental Performance Standard, including a review of Contractor Environmental Protection Plans. Contractors are responsible for identifying and performing environmental compliance audits and inspections and monitoring as required by applicable environmental regulations and permits.

The NWC Program expectation is 100 percent environmentally compliant projects consistent with the Environmental Program Plan and Project-Level Environmental Program, the City's Environmental Policy and the NWC Program HSSE Policy Commitment. In the event of a regulatory agency inspection, the process described in the *Regulatory Agency Communication Inspection Practice* must be followed.

4.5.4 Non-Conformance and Corrective and Preventative Measures

Environmental assessment checklists focus on the overall functioning of the Environmental Program Plan and Project-Level Environmental Program. Actual or potential non-conformances are documented on the assessment checklist. Progress is tracked through to completion with SHELT.

Environmental incidents and environmental assessments required corrective and preventative measures, are documented in a *CANs Worksheet* with an anticipated close-out date and allocation of responsibility for the actions. Non-conformances are largely generated through internal assessments.

Where corrective and preventative actions lead to a change in a documented process, the *CAN Worksheet* will reflect the required change and the document or process owner will be notified. The document will be updated in accordance with Document Control requirements.

4.6 Management Review

See Section 1.5 for details on the management review of the *HSSE Program Plan*.

Appendix A
NWC Security Primer 2017

APPENDIX A

NWC Security Primer 2017

Your part in National Western Center program security is important to every aspect of the NWC safety program. Use the Target Zero (zero security events) concept as well as basic Plan, Do, Check, and Act security mentality in your daily performance of work at NWC.

- Be situationally aware – for your self-protection and watching for impending security issues.
- Respect and protect all assets from damage or loss (employees, contractors, consultants, equity partners, RTD, DRIR, BNSF, and National Western Stock Show) and property of the surrounding community.
- Wear identifying badges, indicating your authorization on the program. Use access cards where required. Prevent unauthorized access via tailgating. Challenge those who do not appear to be part of the NWC workforce.
- Secure all items of value (vehicles, equipment, and tools) including personal items, thus protecting from theft, vandalism, or loss/misuse.
- NWC strictly prohibits the uses or possession of illegal drugs in the workplace (including marijuana) as well as alcohol. A no tolerance policy is in effect.
- Use only approved walkways and roadways. Do not enter posted areas unless you are approved and follow directions on signage explicitly.
- All employees must prevent workplace violence at NWC. NWC has a zero-tolerance policy for noncompliance.
- Report any abnormal security or related issues to your supervisor/manager or the NWC Program Management Team.
- Develop a personal and work-oriented preparedness plan. Be mentally prepared for potential events that could affect your safety and security to support emergency preparedness at the NWC.
- Attend and comply with all security training provided by NWC. Follow instructions posted on bulletin boards.
- Create and store personal and work emergency contacts on your cell phone.
- Call 911 if you witness a life-threatening or serious injury or a critical security issue. Notify your supervisor/manager and the safety and security management teams that a 911 call has been made.

Key security point: A robust security program promoting a secure and safe workplace at NWC is a result of our workforce commitment to basic security processes – you are that NWC committed workforce! Thank you!

Appendix B
Visitor Waiver/Release Form

APPENDIX B

Visitor Waiver/Release Form

The National Western Center Capital Build program is pleased to welcome you to this construction project. Because of the hazards and risks associated with this construction site, we require every visitor to the Site to be alert for his/her own safety and to sign a written Waiver and Release absolving the Owner and others associated with this project of any and all responsibility in connection with all risks encountered at the Site. While on the Construction Premises, please be on guard constantly and follow good safety practices including, but not limited to, the following:

1. Hard-hats, safety glasses and high visibility vests must be worn by all visitors at all times.
2. Although work boots are not required, all visitors shall wear low-heeled leather shoes. High heels of any kind or open-toed sandals are not permitted.
3. All visitors are to be escorted at all times by a badged employee while on the Project Site.
4. Display visitor's badge/sticker on the outer garment at all time
5. BE ALERT for changing conditions and ongoing construction activities while walking on the Project Site. LOOK and LISTEN before you move from one position to another.
6. Be aware of uneven walking surfaces and extreme care shall be taken with each step.
7. No firearms, drugs or alcoholic beverages are permitted on the site.
8. All warning signs and barricades must be obeyed.
9. Do not stray from the approved path for ingress and egress.
10. Be aware of and stay clear of any overhead hazards.
11. No smoking on premises
12. Do not touch construction materials of any kind
13. Do not lean on or reach beyond any handrails or barricades.
14. Report any hazards to the **Program Director** prior to leaving the site.
15. No written correspondence or photography without prior consent of the **Program Director.**

I agree to abide by the Instructions set forth above.

_____

Date and Visitor's Signature

WAIVER AND RELEASE

VISITOR NAME: _____
COMPANY: _____
NAME OF COMPANY/PERSON VISITING: _____

DATE: _____

In consideration of granting the undersigned permission to enter upon the premises at the Project and for other good and valuable consideration, I hereby waive and forever discharge the City and County of Denver, its elected and appointed officials, employees, and volunteers, Western Stock Show Association, Owner's representatives, Program Manager, Construction Manager, all Subcontractors on the project (the "Released Parties") from and against any claim for damages that may arise due to injury to my person or property while on the project whether caused in whole or in part by any negligence, actions or inactions of the Released Parties. I assume the risk of all dangerous conditions on or about the premises and waive notice of the existence of any such conditions.

I acknowledge the confidential nature of the Owner construction procedures and processes and agree not to photograph, reproduce or divulge the same without the written consent of the Program Director.

I HAVE READ THE ABOVE AND AGREE TO SAME:

Signature: _____ Date: _____ / _____ / _____

Escort's First and Last Name: _____

Escort's Badge No.: _____

Appendix C
Crisis Plan

Appendix D
Project-Level Environmental Program

APPENDIX D

Project-Level Environmental Program

Purpose and Scope

This section describes the Project-Level Environmental Program to be implemented by projects on the National Western Center (NWC) Capital Build Program (Program) and is applicable to any City and County of Denver (CCD), NWC projects. Since NWC projects are conducted at various stages and with varying procurement processes, these requirements are designed to be flexible, as described below:

Graded. Where the NWC Capital Build Program is responsible for Environmental Performance, the requirements of this program plan shall be invoked in a graded manner based on a project's significant environmental risks, and where environmental requirements flow down to contractors and the supply chain.

Adaptable. Where the NWC Program takes over a project that is within the CCD's existing public works requirements, the Project Manager shall review the CCD's existing program against the requirements of this Plan and determine whether the CCD's processes meet NWC Program requirements. The Project Manager must assess and document the conformance or nonconformance of each element. This Plan is not adaptable to a system that does not allow for NWC Program Management review.

Contractor Environmental Performance Standard

In addition to compliance with federal, Colorado, and CCD environmental laws, regulations, ordinances and per the City's Department of Aviation, Department of Public Works *Standard Specifications for Construction General Contract Conditions*, 2011 Edition, (i.e., Construction Contract General Conditions) requirements, contractor scopes of work include expectations to perform the following:

- Protect the environment.
- Perform work in such a manner that prevents pollution and environmental incidents to achieve Target Zero.
- Have a qualified, competent, and experienced Environmental Compliance Manager (ECM) assigned to and engaged on the contractor's teams. The ECM is responsible for the contractor's environmental compliance including permit compliance, preventing environmental impacts and pollution, responding to environmental complaints, performance management, and incident and near miss reporting.
- The ECM will develop and require persons involved in the day-to-day construction to participate in an Environmental and Compliance Awareness Training Program. This Training Program will ensure individuals onsite are aware of issues associated with environmental compliance, protection of surrounding environment, air pollution controls, noise and vibration controls, lighting controls, protection of wildlife, trash control, materials storage, good housekeeping practices, and waste management for projects. The training will cover the items included in the contractor's Environmental Protection Plan and permits.
- Implementation of your equivalent environmental systems, programs, processes, and procedures to identify and manage environmental impacts and risks.
- Implement and comply with the NWC Project-specific or Site-wide Material Management Plan (MMP).

- Develop, implement and maintain a written Environmental Protection Plan that identifies best management practices to prevent pollution and includes methods to comply with applicable environmental regulations and permit responsibilities, including, but not limited to:
  - Methods and procedures to minimize and control dust (if a separate Fugitive Emissions Dust Control is not required)
  - Methods and procedures to minimize odor, noise, vibration, and light to surrounding communities.
  - Protection of wildlife including nesting birds
  - Hazardous materials storage (including petroleum) (unless addressed in a separate required environmental compliance plan, such as a Spill Prevention, Control, and Countermeasures [SPCC] plan)
  - Spill prevention, response, notification and reporting requirements, including reportable quantities and agency telephone numbers.
  - Complaints response and management process
  - Waste management, including process to divert from the landfill at least 50 percent of construction waste, and a separate process for managing hazardous waste.
  - Incident, including near misses, reporting, response, investigation and corrective actions
  - Methods to conserve energy and natural resources (water, waste minimization, and minimize air quality emissions)
  - Measurement and reporting against performance targets; communication; and continuous improvement process, and methods to achieve Performance Indicators (PIs) and KPIs.
- Ensure adequate resources, staff, and/or arrangements are in place to effectively implement the requirements of this standard, demonstrating effective alignment of the requirements in support of continual improvement in environmental performance.
- Report monthly on PIs and KPIs, unless otherwise specified.
- Comply with all applicable NWC plans, standards, practices and guidance.
- Implement energy-efficient measures during construction based on the NWC Energy Efficient Construction Guidance.
- Coordinate project activities with surrounding projects to minimize cumulative environmental impacts, assure regulatory compliance, and minimize complaints.
- Conserve natural resources (air, water and waste) when performing work through implementation of best management practices, as documented in the Environmental Protection Plan, and report monthly on performance.
- Maintain vehicles and heavy equipment in proper working condition to be energy-efficient and minimize hazardous air emissions. Routinely inspect for signs of leaks, proper tire pressure and maintained fluid levels.
- Construction waste diversion, where at least 50 percent of construction waste is diverted from the landfill and where a process to achieve this target is documented in the Environmental Protection Plan and is included in monthly performance reporting.
- Maintain a permit log and a calendar based Permit Compliance Tracking Tool to assure compliance with permit conditions.

- Perform work in a conscientious manner where you are aware of your surrounding environment including distance to neighbors, surface water, storm drains and drainage areas, the presence of active migratory bird nests, and any wildlife that may be in the area.
- Participate in SHELT meetings, as directed, regarding environmental performance including incident investigation and reports.

Leadership and Participation

Management Leadership

Policy

See Environmental Program Plan Section 2.1.1

Environmental Management System

See Environmental Program Plan Section 2.1.2

Employee Participation

Project employees, staff, and workers must actively participate in implement of the NWC E Program and are responsible for assuring their projects are compliant with all environmental laws, regulations and city ordinances, and complying with program established environmental standards and practices.

At the project level, employees, staff and workers are encouraged to:

- Participate in the development of the environmental risk and permit registers.
- Participate in and strive to achieve environmental targets and objectives.

Read and understand the project execution and/or management plan and how significant environmental risks and permits are being identified and managed for the project scope of work.

Planning

Identification of a Project Environmental Manager

Project managers are responsible to identify and assign a Project Environmental Manager to their project with multiple significant environmental risks, complying with the responsibilities identified in Section 4.2.6 of the Environmental Program Plan and in conducting the initial and ongoing reviews described below. City Project Managers can rely on DDPHE SMEs, existing public works processes, and/or assign a Project Environmental Manager to conduct these reviews.

Project Stage Gate Reviews

During NWC Project Stage Gate One or Two review, a project's scope of work will be reviewed by the Project Manager and/or the Project Environmental Manager to identify significant environmental risks, environmental regulatory requirements including permits and other requirements that may be applicable to the work to be performed. Early identification is critical to ensuring appropriate cost and schedules reflect compliance with these requirements, as well as including applicable compliance assurance measures for incorporation into procurement and contracts.

Initial and Ongoing Reviews

Projects should be initially reviewed for environmental risks based on the project scope of work and through on-going project reviews (i.e., when scope of work changes, regulatory changes, etc.) until project completion and close-out.

Project Execution or Management Plans with an Environmental Section

Project managers must include a written environmental section within the project management and/or execution plan that documents a project's means to achieve conformance and continual improvement consistent with this Project-Level Environmental Program, including identification of significant environmental risks, required environmental permits, and identification of objectives, targets and KPIs.

Include a table that lists a project's required environmental permits and associated regulatory required environmental plans (e.g., stormwater management plan, Fugitive Emissions Dust Control Plan, SPCC, Regulated Asbestos Containing Soil Management Plan, MMP, etc.) applicable to the scope of work, and documentation of who will obtain and implement the permits. The environmental permits table is developed by either the Project Manager or the Project Environmental Manager, if applicable.

The environmental section may be incorporated into other project related plans such as a Project Construction Plan, project-specific HSSE Plan, work plans or quality plan. The Project Environmental Manager implements the requirements of the environmental section for the project.

The Project Manager and the Project Environmental Manager are responsible for:

- Reviewing and revising the project execution and/or management plan with the environmental section;
- Assess and Measure effectiveness of the environmental section, including adequate allocation of resources;
- Conduct Environmental Performance Monitoring and Reporting;
- Routinely determine if the environmental section is effective;
- Celebrate achievements of project environmental performance goals;
- Prepare documentation for closeout and identification of continuous improvement opportunities for other projects that continue to strive for Target Zero.

Assessment and Prioritization

Projects should implement a process to identify potential environmental impacts, risks, prioritize risks and develop compliance assurance measures based on the scope of work. To assist project teams, the following tools have been developed and can be used by the project teams: the *NWC Environmental Regulations and Other Requirements Register* and the *NWC Site-Wide list of Significant Environmental Risks* (Appendix B) can be used to conduct this assessment.

Objectives and Targets

Objectives, targets and KPIs are identified in section 3.4 of the Environmental Program Plan. In addition, projects should establish the following objectives in their project execution or management plans that reflect NWC's commitment to environmental leadership and Target Zero:

- Provide HSSE leadership by communicating performance expectations, reviewing and tracking performance, and leading by example.

- Encourage employee and staff open lines of communication, involvement and 100 percent participation.
- Implement compliance assurance measures effectively through education, delegation and team work.
- Continuously improve NWC HSSE performance, focusing on higher or significant risks first.
- Ensure contractors respond to and resolve community complaints in a timely manner, and implement corrective actions to prevent re-occurrence.

Implementation and Operation

Project Environmental Responsibilities Summary

Figure E-1 provides a summary of the project's responsibilities for implementing the Project-Level Environmental Program.

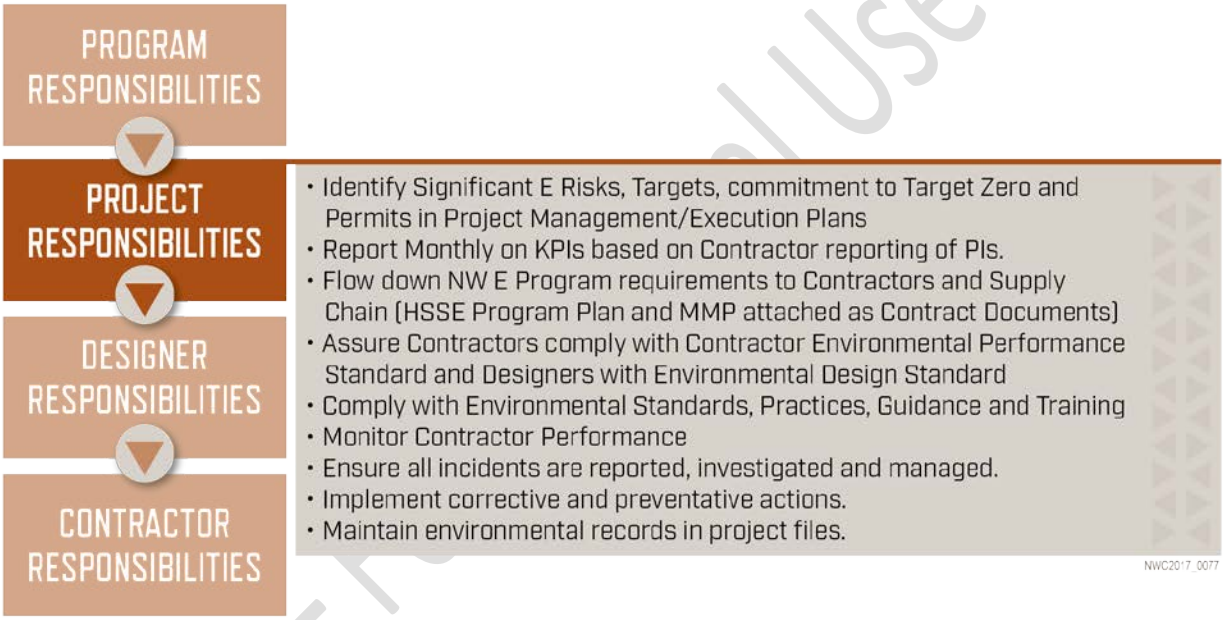


Figure E-1. Project Responsibilities

Project designer and contractor environmental responsibilities are summarized in Figures E-2 and E-3.

Figure E-2. NWC Project Designer Environmental Responsibilities

Figure E-3. NWC Project Contractor Environmental Responsibilities

Responsibility and Authority

Portfolio managers are responsible for assuring the overall implementation of the NWC E Program across their project management teams, demonstrating leadership and commitment in the NWC E Program, establishing environmental expectations, leading the effective implementation of the NWC E Program and compliance with the Environmental Program Plan. Responsibilities for deployment of the

NWC E Program is described in section 4.1 of the Environmental Program Plan, including project-specific roles and responsibilities.

NWC Project-Specific Roles and Responsibilities

NWC Project Manager

See Environmental Program Plan section 4.1.4.

NWC Project Environmental Manager

See Environmental Program Plan section 4.1.5.

Operational Elements

Risk and Compliance Reviews

Section 3.2 of the Environmental Program Plan outlines the risk and compliance management process, and tools for projects to use in identifying project level environmental risks and environmental regulatory and other requirements, including permits.

Appendix B provides a site-wide list of significant environmental risks for projects to include in their risk registers.

Contractor Environmental Protection Plan Reviews

The Project Environmental Manager shall review contractors' Environmental Protection Plans for compliance with Contractors Environmental Performance Standard, including EPP required content, document compliance and applicable significant environmental risk compliance assurance measures.

Procurement and Contracts

Project managers are to assess and oversee contractor environmental performance as described in the Contractor Environmental Performance Standard. Project-specific elements include:

- Ensure a copy of the *HSSE Program Plan* (with the Environmental Program Plan) and if applicable MMPs; are attached as contract documents to all NWC contract/procurements.
- Require and review contractor contract submittals (e.g., permits, environmental plans, environmental protection plans, training records, licenses/certifications, etc.) before work begins; and closely coordinated with health, safety and security.
- Perform oversight to monitor environmental performance with Environmental Program Plan objectives, targets and KPIs, as well as PIs, consistent with the Project-Level Environmental Program.

Standards, Practices and Guidance

Project managers are responsible for implementing the NWC E Program environmental standards, practices and guidance (Section 4 of Environmental Program Plan) applicable to their projects.

Education, Training and Awareness

See Environmental Program Plan Section 4.3, regarding Project Manager requirement to take the NWC Environmental Awareness Training.

Project employees, staff or workers should take project-specific training available through their specific organizations based on the significant environmental risks applicable to the project (e.g., RACS, permit requirements, etc.); as developed by the Project Environmental Manager; and/or take the NWC Environmental Awareness Training.

Communication

Project-specific communication includes information included in the project execution and/or management plan, maintained in a project environmental folder and/or displayed in a prominent location in a field office/project bulletin board. Verbal communication is key in day-to-day execution of a project. Project managers are to encourage contractors to share lessons learned across the NWC Program.

Document and Record Control

Project environmental documentation and records are maintained in project files and must follow City record retention policies and comply with applicable environmental laws and regulations.

Emergency Preparedness

NWC's approach to emergency preparedness is described in the Section 2.13 of the HSSE Program plan and in the NWC's Crisis Management Plan. Emergency preparedness begins at the planning stage and should be included in the project execution and/or management plan or other designated project-specific emergency preparedness plan, project-specific HSSE plan, etc., regarding potential project-specific environmental incidents including spills/releases, and associated notification, response and recovery measures.

Evaluation and Corrective Action

Monitoring and Measuring

Project environmental assessments are performed by the Program Environmental Manager at least annually to evaluate the status and implementation of Environmental Program Plan requirements and effectiveness to achieve the environmental program objectives, targets and KPIs, using the *Environmental Program and Project-Level Environmental Program Assessment Checklists*.

Project managers must report monthly to the NWC Program Environmental Manager on the contractor's environmental incidents, including near misses, performance against the Environmental Program Plan's PIs and KPIs, and routinely monitor and measure the project's overall environmental performance.

Incident Notification, Reporting, Investigation and Management

All incidents that occur on a project require notification and must be reported, investigation and managed as described in the Incident Reporting, Investigation and Management section 2.12 of the *HSSE Program Plan*.

Project Self-Assessments

Projects are required to conduct specific environmental assessment to evaluate their activities for effectiveness to achieve the environmental program targets and objectives.

- Project/contractor assessments are focused on specific environmental risks. Projects with significant or multiple environmental risks are required to have the Project Environmental Manager conduct periodic contractor environmental assessments.
- Specific environmental self-assessments are performed by the Project Environmental Manager to evaluate the status and implementation of Project-Level Environmental Program requirements, using the *Project-Level Environmental Program Assessment Checklist*.

NWC's expectation is 100 percent environmentally compliant projects consistent with the Environmental Program Plan and the Project-Level Environmental Program and the NWC Program HSSE Policy. In the event of a regulatory agency inspection, the process described in the *Regulatory Agency Communication Standard Practice* must be followed.

Corrective and Preventative Actions

Corrective actions are identified and implemented using the self-assessment checklists, incident reporting/investigation and performance tracking. A quality management tool or a *CAN Worksheet* will be used to track corrective and preventative actions, and where project execution and/or management plans or other project-specific documents are modified, followed by communication to project staff.

Management Review

SHELT and/or the Program Environmental Manager must routinely review project implementation of the Environmental Program Plan during project delivery as described in section 6 of the Environmental Program Plan.

Appendix E
NWC Environmental Program List of Significant Environmental Risks

APPENDIX E

NWC Environmental Program List of Significant Environmental Risks

This appendix summarizes significant environmental risks (aspects and impacts) of the NWC Program. These risks have been identified in the *NWC Environmental Program Risk Register.* Risk significance is evaluated based on severity criteria (six levels of significance) and likelihood of the impact to occur (low, medium, or high), as shown in Table F-1.

Table F-1. NWC Environmental Program Risk Ranking

Severity Criteria is ranked into six levels of significance listed in the following table. August 2017	
Criteria	**Severity**
Changes that result in positive impact to environment-Beneficial Opportunity	6. Beneficial
Substantial environmental damage; remediation; enforcement and/or litigation; national media coverage and protestor action	5. Substantial
Significant environmental damage; high enforcement penalties; Major local press coverage, specialist press coverage (construction industry or environment specific)	4. Significant
Correctable environmental damage; high regulatory burden; low to average enforcement penalties; Minor local press coverage	3. Moderate
Limited and correctable environmental damage; average regulatory burden; complaints from local residents	2. Minor
No significant consequences; no impacts; low regulatory burden; no reputational impact	1. Negligible

Likelihood of occurrence of the impact is rated according to the criteria outlined below		
Likelihood to Occur	**Category**	**Score**
Impact is highly likely or certain to occur under normal operating and/or demolition/construction conditions	High	C
Impact may possibly occur under normal operating and/or demolition/ construction conditions	Medium	B
Impact is unlikely to occur under normal operating and/or demolition/ construction conditions; however, it may occur in exceptional circumstances.	Low	A

Based on the level of severity, and likelihood of occurrence, the impact significance is determined as follows:				
		Likelihood Rating		
		A	**B**	**C**
Severity Rating	1	**1A**	**1B**	**1C**
	2	**2A**	**2B**	**2C**
	3	**3A**	**3B**	**3C**
	4	**4A**	**4B**	**4C**
	5	**5A**	**5B**	**5C**
	6	**6A**	**6B**	**6C**

Table F-1. NWC Environmental Program Risk Ranking

KEY				
Severity		**Likelihood**	**Significance**	
1. Negligible	4. Significant	A- Low		LOW
2. Minor	5. Substantial	B-Medium		MODERATE
3. Moderate	6. Beneficial	C-High		HIGH
				POSITIVE

Table F-2 summarizes the NWC E Program List of Significant Environmental Risks and Opportunities, and Objectives.

Table F-2. NWC Environmental Program List of Significant Risks and Opportunities, and Objectives

Significant Environmental Risks	Desired Outcome (Objective)
Invasive Work in Contaminated Soil	Regulatory compliance and no serious environmental impact
Regulated Asbestos Contaminated Soil (RACS)	Regulatory compliance and no serious environmental impact
Invasive Work in Contaminated Groundwater	Regulatory compliance and no serious environmental impact
Invasive Work involving hazardous materials/asbestos/lead based paint (LBP)	Regulatory compliance and no serious environmental impact
Permits	Regulatory compliance and no serious environmental impact
Hazardous Waste	Regulatory compliance and no serious environmental impact
Hazardous Materials Use and Storage (including petroleum)	Regulatory compliance and no serious environmental impact
Regulated Nuisance (Dust, Noise, and Odor)	Regulatory compliance and minimized complaints
Unexpected and Unplanned Site Conditions	Regulatory compliance and no serious environmental impact
Projects with Multiple Environmental Risks	Regulatory compliance and no serious environmental impact
Cumulative Impacts	Coordination of project activities with surrounding projects to minimize cumulative impacts, assure regulatory compliance, and minimize complaints
Remediation Sites including historic urban fill areas	Regulatory compliance, no serious environmental impact, and reduced environmental contamination
PCE Plume Migration (from offsite source)	Regulatory compliance and no serious environmental impact
Vapor Intrusion	Regulatory compliance
Significant Environmental Opportunities	**Desired Outcome (Objective)**
Energy Efficiency	Conserve Energy and Natural Resources
Water Use	Conserve Natural Resource and Minimize Potable Water Use
Air Quality	Conserve Natural Resource
Construction Waste	Conserve Natural Resource and Construction Waste Diversion

Exhibit V – Materials Management Plan

Pinyon Environmental, Inc.

Corporate Headquarters
9100 West Jewell Avenue Lakewood, CO 80232
TEL 303 980 5200 FAX 303 980 0089
www.pinyon-env.com

December 22, 2017

Materials Management Plan

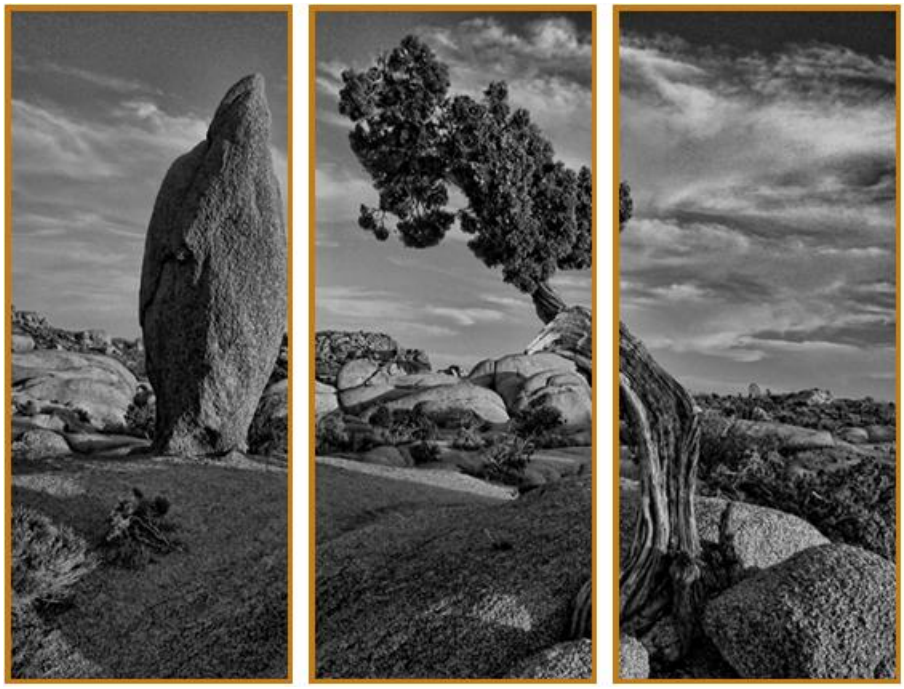
National Western Center Redevelopment
Denver, Colorado

Prepared For:

City and County of Denver
200 West 14th Avenue, Department 310
Denver, Colorado 80204

Pinyon Project No.:

1/17-007-06



December 22, 2017

Materials Management Plan

National Western Center Redevelopment
Denver, Colorado

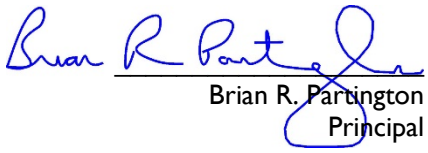
Prepared For:

City and County of Denver
200 West 14th Avenue, Department 310
Denver, Colorado 80204

Pinyon Project No.:

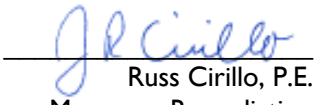
1/17-007-06

Prepared by:



Brian R. Partington
Principal

Reviewed by:



Russ Cirillo, P.E.
Technical Group Manager - Remediation

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Tables

Figures

Appendices

List Acronyms

Acronym	Definition
ACM	Asbestos-Containing Materials
APEN	Air Pollution Emissions Notice
AQCC	Air Quality Control Commission
CABI	Certified Asbestos Building Inspector
CASDP	Construction Activities Stormwater Discharge Permit
CCR	Colorado Code of Regulations
CDOT	Colorado Department of Transportation
CDPHE	Colorado Department of Public Health and Environment
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CGP	Construction General Permit
CHMM	Certified Hazardous Materials Manager
CIH	Certified Industrial Hygienist
CSP	Certified Safety Professional
CSU	Colorado State University
CWRSL	Composite Work Regional Screening Level
DADS	Denver-Arapahoe Disposal Site
DDPHE	Denver Department of Public Health and Environment
DPS	Denver Public Schools
DRIR	Denver Rock Island Railroad
EPA	Environmental Protection Agency
FID	Flame Ionization Detector
HASP	Health and Safety Plan
HSO	Health and Safety Officer
HSSE	Health, Safety, Security and Environment
HUF	Historical Urban Fill
LEL	Lower Explosive Limit
MMP	Materials Management Plan
MODCP	Methane, Odor, and Dust Control Plan
NDCC	North Denver Cornerstone Collaborative
NPL	National Priority List
NWC	National Western Center

Acronym	Definition
NWCO	Mayor's Office of the National Western Center
OPS	Colorado Department of Labor and Employment, Division of Oil and Public Safety
OSHA	Occupational Safety and Health Administration
PCB	Polychlorinated biphenyls
PCE	Tetrachloroethylene
PID	Photoionization Detector
PPE	Personal Protective Equipment
PSRMP	Project-Specific Regulated Asbestos Contaminated Soil Management Plan
RACS	Regulated Asbestos Contaminated Soil
RAMP	Remediation Activities Management Plan
RCRA	Resource Conservation and Recovery Act
RRSL	Residential Regional Screening Level
RSL	Regional Screening Levels
SWMP	Stormwater Management Plan
TCLP	Toxicity Characteristic Leaching Procedure
TSDF	Treatment, Storage, and Disposal Facility
UEL	Upper Explosive Limit
UST	Underground Storage Tank
WQCD	Water Quality Control Division
WSSA	Western Stock Show Association
mg/kg	Milligrams per Kilogram
mg/L	Milligrams per Liter
µg/L	Micrograms per Liter

1. Introduction

Pinyon Environmental, Inc. (Pinyon), was retained by the Denver Department of Public Health and Environment (DDPHE), in collaboration with the Mayor's Office of the National Western Center (NWCO), to prepare this Materials Management Plan (MMP) to support the enabling work and other improvements at the National Western Center (NWC) in Denver, Colorado.

It is the intent that this MMP will be attached to the project Plans and Specifications, and that bidding Contractors will have an opportunity to review this document as they prepare bids for enabling work. Further, it is expected that the project engineers completing horizontal design work will review and incorporate this MMP into project specifications, and, as needed, develop remedial strategies using this MMP as a basis of design. This MMP has been prepared to ensure, when properly implemented by the future-selected Contractor (Contractor), that work activities will be completed in such a way as to protect human health and the environment. Further, this MMP has been prepared to minimize potential delays, and to develop approved standard procedures that will be implemented as needed if suspect materials are encountered during construction. It is the responsibility of the Contractor to follow all appropriate regulations, obtain the proper permits, and utilize field personnel trained to identify potential contamination. If any discrepancy is noted between this MMP and any applicable regulation, the regulation will take precedence, unless a variance has been previously approved by the regulatory agency.

1.1 Proposed Action

The NWC represents a visionary transformation of the National Western Complex and Denver Coliseum into a year-round destination. Enhancing these Denver landmarks and expanding the campus to approximately 250 acres, the NWC will strengthen Denver's global standing as a world-class hub for entertainment, education, research and agribusiness. It will also provide a modernized home for the National Western Stock Show for the next 100 years.

The project's founding partners include the City and County of Denver (Denver), Western Stock Show Association (WSSA), Colorado State University (CSU), the Denver Museum of Nature and Science and History Colorado – a collaboration that blends education, research, culture, heritage and economic development efforts. The mission is to convene the world at the NWC to lead, inspire, create, educate and entertain in pursuit of global food solutions.

The NWC Phases 1 and 2 Capital Build Program (Program) is now entering the implementation phase, with a complex schedule as the construction must be delivered within an active Site, that includes WSSA event operations (including the National Western Stock Show every year in January), 3rd party tenant access and business operations, and live rights-of way.

The Program is very supportive of the surrounding communities, in terms of maximizing the benefit of the campus to the adjoining neighborhoods, workforce, and local businesses, and providing opportunities for local firms and residents to engage in the work. At the same time, the Program must maintain safety and minimize the environmental impacts construction has on the local infrastructure and surrounding community.

In addition, the Program has several emerging programmatic goals that will be delivered throughout the Program lifecycle that are integral to the design development across the campus. These programmatic goals are vital in ensuring a successful outcome for the Program.

Programmatic Goals:

- Health, Safety, Security and Environment (HSSE) – Achieve world class health, safety, security, and environmental performance
- Cost – Deliver the Program within the defined budget while respecting funder investments, maintaining fiscal transparency and sustainability, and maximizing the value of every dollar spent
- Schedule – Deliver the Program on time and predictably to achieve Program milestones
- Design – Design the campus and its facilities to reflect the desired character in a cost-effective manner that makes the campus accessible, functional/operational, safe/secure, and sustainable while preserving and enhancing the its historic and cultural value
- Pioneering – Foster innovation, entrepreneurship, independence, and ingenuity across the program
- Concurrent Operations – Ensure the Program activities consider and integrate with ongoing campus operations and events
- Regeneration (known as ReNEWW – 'Regeneration of Natural environment, Energy, Water and Waste) – Integrate an ethic of regeneration across the Program to secure a sustainable legacy
- Community – Meaningfully engage and activate the community to improve

This document has been prepared to support the NWC Capital Build Horizontal Portfolio, which is made up of the design and construction of early enabling works and Site-wide infrastructure, as well as a number of plot-specific projects that are civil/infrastructure related. The program scope elements which generally comprise the Horizontal Portfolio for Phases 1 and 2 of the Capital Build are described below:

- **Enabling Works** – Purpose of the project(s) is to transform the existing Site conditions and implement the necessary changes to support final construction of horizontal infrastructure and vertical facilities. This will include, but not be limited to: Site clearance (including removal of known underground obstructions), earthworks and Site grading, general environmental remediation, construction of temporary parking lots, and construction and logistics management of existing and temporary utilities.
- **Riverfront Open Space** – To create the green open space along the eastern bank of the South Platte River to provide a public, educational, and recreational space that engages the river and nature as part of the NWC year-round programming.
- **Site-Wide Infrastructure** – To develop the infrastructure network (roads, utilities, sidewalks, bridges, elevated walkways, etc.) needed to provide the access within and at the boundary of the Site for multi-modal access.
- **DPS Remediation** – Convert the old Denver Public Schools (DPS) Bus Barn Site, a Historical Urban Fill (HUF) Site, into a developable plot.
- **Brighton Boulevard** – Design and construct the new Brighton Boulevard segment from 47th Avenue to Race Court, including providing the necessary aesthetic overlay for others (Colorado Department of Transportation [CDOT]) to deliver from East 44th to East 47th Avenues.

- **DRIR Rail Consolidation** – Design and construction to consolidate the Denver Rock Island Railroad (DRIR) rail operations at new locations that are supportive of the wider NWC campus operations.

  Note, the DPS remediation and Brighton Boulevard reconstruction projects are not covered under this MMP.

This MMP has been developed to provide guidance in identifying and managing contaminated soil and materials discovered during subsurface excavation activities at the NWC, primarily during enabling works and Site infrastructure projects. Generally, the enabling works phase would result in achieving rough Site grading and construction of associated infrastructure (i.e., new utilities, roadways). The Contractor will use the information presented in this document to clarify the Contractor's roles and responsibilities in managing contaminated soil and materials encountered during the enabling works and Site infrastructure projects.

It is the responsibility of the Contractor to follow all appropriate regulations, obtain the proper permits, and utilize field personnel trained to identify potential contamination. In the event, any discrepancy is noted between this MMP and any applicable regulation, the regulation will take precedence.

1.2 Exclusions from this MMP

This MMP generally applies to the Horizontal Portfolio for Phases 1 and 2 of the Capital Build; however, the following elements are specifically excluded from this MMP and will be addressed separately:

- DPS Remediation
- All work south of I-70 (i.e., Coliseum redevelopment, Forney Transportation Museum, Globeville Landing Park)
- Northside Park/Heron Pond
- La Mouton property located at 4847 National Western Drive

1.3 Key Parties and Responsibilities

The Contractor is responsible for providing this MMP to its staff and subcontractors and for compliance with the MMP. Through implementation of this MMP, Denver will be immediately notified of potential environmental-related findings pertaining to construction activities at the Site. The key parties, their contact information and project responsibilities, are outlined below (Table 1-1):

Table 1-1 Key Parties and Responsibilities

Organization	Role/Responsibility	Contact Information
Denver Department of Public Works	Public Works Project Manager	David Richards Phone: 720-472-2765 Email: David.Richards@denvergov.org
North Denver Cornerstone Collaborative (NDCC)	NDCC Project Manager (in coordination with DDPHE)	Andrew Ross Phone: 720-865-5458 Email: Andrew.Ross@denvergov.org

Organization	Role/Responsibility	Contact Information
NWCO	Vertical Portfolio Manager	Jeff Mack Phone: 720-865-2925 Email: jeff.mack@denvergov.org
DDPHE	Environmental Quality Technical Oversight	Agatha Linger Phone: 720-865-5356 Email: Agatha.Linger@denvergov.org or Dave Wilmoth, PE PG Phone: 720-865-5438 Email: Dave.Wilmoth@denvergov.org If no immediate response, call 720-460-1706
Design Engineer	Horizontal Design Engineer	TBD
Construction Contractor	Health and Safety Officer/ Construction	TBD
TBD	MMP Supervisor and Certified Asbestos Building Inspector (CABI)/ Environmental oversight quality assurance to identify potentially contaminated soil and potential asbestos	TBD

1.4 Site Description

Historically, the NWC has been utilized for livestock-related commerce and industry including large-scale slaughter houses and meat processing, extensive railroad operations, industrial warehousing, and stockyards. Some residential development occurred in the area along Brighton Boulevard and southeast of the current National Western Complex. Additionally, portions of the NWC area lie within the area defined as Operable Unit 1 of the Vasquez and I-70 Superfund Site (VB/I70), which is specific to residential properties.

The NWC consists primarily of 65 parcels totaling approximately 250 acres, owned by the WSSA surrounded by industrial, commercial, and residential privately-owned parcels (Figure 1). The WSSA-owned parcels are occupied by the following structures:

- Two large stadium buildings with arenas
- Live stock yards and barns
- Parking lots

- An event center
- Two warehouses
- An office building
- A boarding house

Denver is in the process of acquiring the privately-owned parcels within the NWC in an effort to consolidate and revitalize the area. The privately-owned parcels included in the NWC consist of approximately 39 parcels. The privately-owned parcels are occupied by the following structures:

- Seven residential houses and outbuildings
- Six commercial buildings
- 16 industrial warehouses
- Three industrial factories
- One industrial food processing building
- One gas station/convenience store

1.5 Environmental Conditions

Numerous environmental studies have been completed at and in support of the NWC; a summary with references is included with this MMP as Appendix A. The summary includes a parcel by parcel description of the environmental conditions that have been identified during Site-wide investigations, Phase I Environmental Site Assessments (ESAs), and Phase II ESAs. It further describes the outstanding environmental concerns expected, by parcel, and field monitoring needs, as described herein. Denver will make those studies available to the Contractor (as requested), and the Contractor is encouraged to review those documents, particularly prior to commencing enabling work at or near specific parcels. The following subsections describe the general environmental concerns identified for the NWC.

1.5.1 Groundwater

A groundwater plume originating southeast of the Site extends to areas beneath the NWC (Figure 1). The plume includes low concentrations (~55 micrograms per liter [µg/l] or less) of tetrachloroethylene (PCE); note, the Colorado Ground Water Standard for PCE is 17 µg/L. The area of highest concentration is the southeast portion of the Site and groundwater depths have been reported between 20 and 30 feet below ground surface during previous assessments. Vapor intrusion is not a concern based on the above-referenced concentrations, depth-to-groundwater, proposed slab-on-grade construction, and preliminary soil gas evaluations.

1.5.2 Historical Urban Fill

Three HUF areas have been identified near the Site boundaries, including the DPS property northeast of the intersection of Brighton Boulevard and East 48th Avenue, the Denver Coliseum property south of I-70 and east of the South Platte River, and an unnamed fill within the northeast corner of the study area (Figure 1). Methane in soil has been identified proximate to both the DPS and Denver Coliseum HUF areas; methane has not been thoroughly evaluated near the northeast fill area, but is suspected of being a concern.

Buffer areas have been added to Figure 1, including a 250-foot buffer, and a 500-foot buffer. Areas within the 250-foot buffer are assumed to have a high methane risk below the surface; areas within the 500-foot buffer are assumed to have a moderate methane risk below the surface. "Risk" assumes both an explosion risk, as well as an asphyxiation risk. These buffers are offered as general guidelines; however, methane can travel laterally from an HUF through the path of least resistance, including loose or porous soil and utility corridors.

Methane can become explosive if it is present in sufficient concentration and comes into contact with an ignition source. Methane has a Lower Explosive Limit (LEL) of 5% by volume, and an Upper Explosive Limit (UEL) of 15% by volume. Methane concerns, construction mitigation, as well as engineering considerations, are addressed in detail in the Methane, Odor and Dust Control Plan (MODCP) attached as Appendix B.

1.5.3 Building Demolition and Uncontrolled Fill

In addition to the HUF areas noted above, demolition debris from historical structures is present across the NWC area, or is suspected to be present (Figure 1). Those buildings have included slaughter houses, industrial facilities, hay barns, automotive facilities, and residences. The buildings were razed in an era where asbestos assessment and abatement were not required. The historical buildings noted on Figure 1 are also guidelines regarding the potential for discovering buried debris; other buildings may have been located on the NWC that have been razed, or uncontrolled or undocumented filling could have occurred. Areas of construction debris, remnant foundations, or other undocumented or uncontrolled filling have the potential to contain Regulated Asbestos Contaminated Soil (RACS), and other contaminants or universal wastes. Further, buried structures may result in unstable building platforms, where voids or settlement could occur.

Uncontrolled fill may include soil mixed with coal, ash, building debris, or other unidentified wastes. Areas near the South Platte River may contain significant amounts of this material where materials were placed along the river to channelize the river or prevent erosion/flooding by raising the ground surface. Previous investigations that identified "coal-based fill" demonstrate that soil may exhibit concentrations of metals and/or polycyclic aromatic hydrocarbons (PAHs) above certain screening limits suitable for residential or park uses. These materials are often visually characterized as dark brown or black soil with evidence of brick, coal or other solid wastes being present.

1.5.4 Underground Storage Tanks

Former leaking underground storage tanks (LUSTs) and possible remaining/orphan underground storage tanks (USTs) were also identified as environmental concerns (Appendix A; Figure 1). These may include regulated tanks and releases, as well as historical and unregulated orphan tanks and service stations, or tanks associated with building components (e.g., tanks used to store heating oil or waste oil). It is possible that unregulated or undocumented tanks may be present and discovered during subsurface work.

1.5.5 Vasquez Boulevard/I-70

The NWC is located within the impacted area of the historical Omaha and Grant Smelter. This listing is part of a larger Vasquez Boulevard and I-70 Superfund Site (VB/I70) comprising approximately four and one-half square miles, due to metals contamination associated with historic smelting operations. For the purposes of the remedial investigations and remedy development, the VB/I70 Site was separated into three operable units (OUs). The portion of the NWC that applies to this MMP is located within Operable Unit 1 (OU1), defined as residential yards with concentrations of lead or arsenic in soil that may present an unacceptable risk to human health. OU1 constituted the highest priority for the US Environmental Protection Agency (EPA), as it had the highest potential for human exposure to contaminants of concern located in residential yards.

On July 16, 1997, the Colorado Department of Public Health and Environment (CDPHE) collected 25 soil samples from the residential yards in the Elyria and Swansea neighborhoods of Denver, situated to the north of the elevated portion of Interstate 70. The purpose of this sampling was to determine whether a threat to human health existed in the area due to historical smelting operations. Analysis of the 25 soil samples indicated elevated levels of arsenic, cadmium, and lead were present. The discovery of these contaminants prompted further investigation to delineate the extent of arsenic, cadmium and lead present in soil of north Denver.

An extensive soil sampling program was conducted by EPA in April 1998 and included the collection of 3,550 samples from parks, schools, and residences in the area. Samples were screened for impacts in the field and approximately 10 percent were sent for confirmatory laboratory analyses. Low levels of arsenic and lead were detected in the samples from the schools and parks sampled, and removal and replacement of the soil at these properties was not required. Based on the results of the Phase I and Phase II sampling programs, the EPA determined that residential properties within the VB/I70 Site had been impacted by concentrations of arsenic or lead at levels that could present unacceptable health risks to residents with long-term exposures. On this basis, the EPA proposed the VB/I70 Site for inclusion on the National Priority List (NPL) of Superfund Sites in January 1999 and with cleanup levels of 400 milligrams per kilogram (mg/kg) lead and 70 mg/kg arsenic.

2. Health and Safety

Because of the potential to encounter suspect materials, there is a possibility for increased risk to the health of workers during excavation within the Project area. Project personnel must be made aware of the potential hazards and worker safety and awareness is of the highest priority. Therefore, a Health and Safety Plan (HASP) must be developed by the Contractor.

The Contractor will be required to employ the proper personnel, monitoring equipment, and personal protective equipment (PPE) to provide a safe working environment for its employees, consultants, and sub-Contractors. The Contractor's field personnel must conduct work in Level D PPE until conditions arise that require additional protection. The decision to require additional protection is the responsibility of the Contractor's Health and Safety Officer (HSO) and should be evaluated based on observation of worker conditions. An MMP Supervisor will be designated and it is the responsibility of the MMP Supervisor to provide the HSO with information regarding environmental conditions, as available, to assist in that decision. The provisions of this MMP are summarized below, and will be incorporated into the HASP. However, in no way shall the HASP be limited to these provisions.

- The Contractor must develop a HASP in accordance with 29 Code of Federal Regulations (CFR) 1910 (Occupational Safety and Health Standards) and 29 CFR 1926 (Safety and Health Regulations for Construction) for the Project.
- The HASP must be prepared to address the environmental conditions described in this MMP, and the attached MODCP.
- The HASP must include provisions and precautions needed in the event work is conducted within or in proximity to HUF areas, and should specifically address asbestos and explosive/asphyxiating gases.
- Workers and managers associated with intrusive Project area activities will be required to undergo a one-time health and safety orientation meeting at the start of the Project, to include a brief on-Site description of Project area conditions. This meeting must include two-hour asbestos awareness training conducted by a trained asbestos professional (i.e., CABI). If Project personnel change for any reason during Project work (i.e., additional or replacement personnel), additional asbestos awareness trainings are required.
- The general Contractor may share its HASP with its subcontractors or require each subcontractor to prepare its own plan.

3. Responsibilities

The following sections detail the responsibilities of the applicable parties that will be associated with the enabling work at the NWC.

All personnel that will be conducting any subsurface work/earth disturbing activities will complete mandatory two-hour asbestos awareness training by the CABI, as described below.

3.1 Denver Responsibilities

3.1.1 Public Works

Denver, in partnership with NWCO, and its Equity Partners, is the project owner. As such, Denver will be responsible for:

- Overall project management
- Contracting with the Contractor

3.1.2 DDPHE

The DDPHE is the local health authority. DDPHE will oversee and approve remedial work and provide overall environmental-related oversight of the work completed by the Contractor.

3.2 MMP Supervisor

Prior to implementation of the MMP, the awarded Contractor will retain an MMP Supervisor to independently verify that the requirements of this plan are followed in a Quality Assurance (QA) role. The MMP Supervisor must be a competent individual with at least two years of experience in the field-identification of suspect regulated materials and potential environmental hazards (e.g., abandoned underground storage tanks, asbestos, uncontrolled fill), as well as appropriate characterization, management, and disposal methods for impacted materials. The MMP supervisor will have a minimum training requirement of 40-Hour Occupational Safety and Health Administration (OSHA) Hazardous Waste Operations Training and current 8-hour OSHA annual update. **Ideally, the MMP Supervisor will also meet the requirements of a CABI, as described in Section 3.3**. It is the responsibility of the MMP supervisor to:

- Be on-Site, on a full-time basis, during all soil-disturbing activities, and have the necessary equipment, field screening meters, sampling materials, and incidental items necessary to respond quickly to unidentified environmental conditions discovered during excavation activities.
- Complete daily field notes detailing environmental conditions and responses to suspect materials that are identified.
- Provide regular updates to Denver Public Works, DDPHE and the NWC Program Manager.
- Ensure adherence to the MMP by identifying suspect materials and applying proper procedures outlined herein.
- Verify or perform field screening of soil in adherence to this plan.
- Confirm Soil Evaluation Criteria, as described in this plan.

- Notify Denver immediately of any unexpected environmental conditions or potentially impacted material. If RACS is discovered, a notification to the state must be filed and a copy must be submitted to the Denver Project Manager and DDPHE within 24 hours in addition to immediate notification to DDPHE.

- Be on-Site to verify Project operations on an as-needed basis when potentially impacted media have been encountered.

- Coordinate with DDPHE in obtaining the appropriate landfill disposal approvals, including waste profiles and waste manifests. Coordinate with the Contractor to confirm that waste materials to be disposed off-Site match the appropriate waste profiles and manifests. Track and/or sign tickets and manifests for material hauled off-Site for either reuse or disposal. Notify DDPHE immediately if removed wastes are required to be managed as hazardous waste under the Resource Conservation and Recovery Act (RCRA), and to ensure appropriate steps including generator notification.

- Complete logs that thoroughly detail Project QA activities.

3.3 Certified Asbestos Building Inspector

Oversight and documentation of RACS shall be conducted by a CABI who meets the training requirements of Section 5.5.3(D) of the Regulation Pertaining to Solid Waste Work Sites and Facilities. The CABI will also be trained and certified in accordance with Air Quality Control Commission Regulation No. 8 (5 CCR 1001-10, Part B), for the identification of asbestos-containing materials and the collection of samples to evaluate asbestos content. All CABIs must have worked on at least three different asbestos-in-soil projects and with a minimum of 40 hours of experience as a CABI. The CABI must have sufficient experience to identify HUF, and associated RACS in the field. Depending on the project schedule, a minimum of one CABI will be overseeing excavation work, and it may be necessary to engage multiple CABIs if areas of known historical fill or debris are identified at multiple excavation areas.

For this project, the CABI will complete the following:

- Be on-Site, on a full-time basis, if any soil-soil disturbing activities will or may occur in areas where uncontrolled filling, HUF, or demolition debris may occur.

- Conduct Two-Hour Asbestos Awareness Training for all Site personnel who perform any soil disturbing activities. For the purpose of this MMP, those that could encounter these materials are any workers that could engage in subsurface excavation work, such as equipment operators and laborers. Two-hour Asbestos Awareness Training should include such topics as:

    - Information regarding the project scope of work
    - Background information on asbestos, including general awareness and regulations
    - Description of non-suspect asbestos-containing material (ACM) (i.e., inert debris, landscaping materials)
    - Health effects of asbestos
    - Worker protection programs
    - Recognition of suspect materials, including HUF, debris, or other materials that indicate reason to believe that RACS may be present
    - Site-specific concerns related to asbestos and HUF

- Immediate actions should asbestos be suspected

- The CABI will be present on a full-time basis during excavation in areas where HUF is located, or where RACS is suspected or confirmed, or during excavation where historical buildings once existed and no information regarding building assessments/abatement are available.
- Collect samples of suspect materials as needed.
- When there is no reason to believe that RACS would be present during excavation activities, the CABI does not need to be present; however, the CABI should be available to mobilize to the Site within 24 hours should workers identifying suspect materials.
- Waste that can clearly be identified as only landscaping-type waste does not require CABI oversight.
- If RACS is managed during the project, it is the responsibility of the Contractor and CABI to ensure that the subcontractor performing RACS disturbance is capable of meeting the state requirements.

3.4 Contractor

The Contractor will be responsible for the following:

- Coordinating review of the MMP requirements with the MMP Supervisor, DDPHE, City Project Manager and the Program Manager prior to beginning work.
- Updating the MMP Supervisor regularly on schedule, progress, etc., and provide adequate notice to the MMP Supervisor and CABI for field oversight and scheduling.
- Initiating tailgate meetings with its workers and appropriate parties, including the MMP Supervisor and CABI, before subsurface work begins, to educate personnel on the hazards regarding regulated materials on the Site, and the mitigation measures presented herein.
- Coordinate Two-Hour Asbestos Awareness training to all employees that may conduct earth-disturbing activities.
- Preparing a Project-Specific Regulated Asbestos-Contaminated Soil Management Plan (PSRMP), and implementing as necessary in coordination with the DDPHE.
- Designating an HSO.
- Providing necessary equipment and personnel to implement the MMP.
- Ensuring that subcontractors adhere to the MMP during Project work.
- Ensuring that proper procedures for material reuse or disposal are followed. This includes ensuring that suspect material that has been disturbed is not reused on-Site unless it meets the designated reuse criteria or is disposed in accordance with applicable regulations and not in storm drains, sanitary sewers, streams, irrigation facilities, or waterways.
- Ensuring that non-salvageable, non-hazardous solid waste materials excavated are removed from the Site and disposed of at the Denver-Arapahoe Disposal Site (DADS) in accordance with local, state and federal laws and Denver executive order.

- Contacting the Project Manager and Program Manager for conditions resulting in schedule or budget impacts to the project.
- **If suspect HUF, debris, household waste, coal-based fill, or RACS is encountered, immediately stop work, secure the work area in such a manner to prevent any and all unauthorized entry, and contact the MMP Supervisor and the CABI to evaluate the situation**.
- If RACS is managed during Project activities, it is the responsibility of the Contractor and CABI to ensure that the subcontractor performing RACS disturbance/management is capable of meeting the State requirements.
- Consult with DDPHE on any wastes that must be managed as RCRA hazardous wastes.
- Acquisition and compliance for all required environmental permits
- Reporting of spills to appropriate regulatory agencies. **Note, any and all coordination or reporting to a regulatory agency must be approved by DDPHE beforehand.**

3.4.1 Health and Safety Officer

Prior to the initiation of Project work, the Contractor will designate an HSO. The HSO must:

- Evaluate the need for, and then implement health and safety monitoring during subsurface work
- Evaluate the appropriate level of PPE based on health and safety monitoring to be completed during subsurface work
- Ensure that Project activities and personnel adhere to the HASP set in place by the Contractor

3.4.2 Tier 1 – Front-Line Workers

Tier 1 workers include personnel that would be responsible for mitigating suspect materials and include equipment operators and laborers actually handling materials in accordance with this MMP. These workers must:

- Complete training on identification of suspect materials by the MMP Supervisor, including asbestos awareness training conducted by the CABI
- Complete work as directed by the MMP Supervisor, and in accordance with this MMP and HASP requirements
- Complete work in accordance with the requirements of the OSHA 29 CFR 1910.120. The level of training in accordance with CFR 1910.120 shall be the decision of the HSO.

3.4.3 Tier 2 – Excavation Workers

Tier 2 workers include personnel that could encounter potentially impacted materials during the course of work, but will not be responsible for management of these materials. These employees include, but are not limited to front-line equipment operators, foremen, and operators that will complete typical excavation

activities during the project, but will not complete handling of these materials after discovery. These personnel must:

- Complete training on identification of suspect materials by the MMP Supervisor, including asbestos awareness training conducted by the CABI.
- Complete work as directed by the MMP Supervisor, and in accordance with this MMP and HASP requirements.
- Immediately stop work in the event that potentially suspect materials are identified, and contact the MMP Supervisor of the discovery.

Complete work in accordance with the requirements of the OSHA, 29 CFR 1910.120. The level or training in accordance with CFR 1910.120 shall be the decision of the HSO.

3.4.4 Tier 3 – Other Workers

Tier-3 workers include personnel that will not complete sub-surface work activities. As the potential for these workers to encounter impacted materials on this project is low, MMP training requirements do not apply.

4. Soil

4.1 Soil Evaluation Criteria

CDPHE Groundwater Protection Values, EPA Regional Screening Levels (RSLs; https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables-november-2017) (Appendix C) and other state/federal guidance will be used for comparison to soil data. In addition to the Denver's Guidance for Reuse of Soil on City Projects (Appendix D), the following guidance is applicable for evaluating soil concentrations for varying exposure scenarios:

- **CDPHE Groundwater Protection** – These are often the most protective values and were developed to protect groundwater; these values are the maximum chemical concentration in soil that will not leach into groundwater. The CDPHE-Hazardous Materials and Waste Management Division Groundwater Protection Values Soil Cleanup Table (Appendix C) values will be used for comparison to soil data.

- **EPA RSL Residential Protection** – These are the second most protective values and are typically the soil concentrations that would be considered appropriate for reuse in residential areas without restriction (except where values do not meet groundwater protection values as described above). These are the Residential Regional Screening Levels (RRSLs, Appendix C; https://semspub.epa.gov/work/HQ/197029.pdf). It is expected that the RRSLs would apply for recreational (e.g., parks and open space), or residential (single-family, multi-family, mixed-use with residential component) properties (Appendix D).

  Note, related to the NWC development, the RRSLs would apply to the following planned activities:

  - South Platte Riverfront, which would be classified and used as a park

- **EPA CWRSL Composite Worker Protection** – These are the third most protective values, and are the acceptable concentrations that would be protective for City workers on City-owned properties such as right of ways (e.g., roads, sidewalks, bike paths), utilities corridors (e.g., stormwater, wastewater, water), or City-owned facilities (e.g., maintenance garages, office buildings, safety buildings) (Appendix C; https://semspub.epa.gov/work/HQ/197033.pdf). Material meeting the Composite Worker Regional Screening Level (CWRSL) may be reused on Site, as all properties but the South Platte Riverfront addressed within this MMP will have an ultimate configuration for meeting the CWRSL acceptance criteria as described in Appendix D, pending laboratory analysis. Soil with concentrations that exceed the CWRSL will be removed from the Site, and disposed at DADS.

  Note, related to the NWC development, the CWRSLs would apply to the following planned activities:

  - Stockyards/Event Pavilion
  - CSU Equine Sports Medicine Clinic
  - Equestrian Center
  - Livestock Center
  - NWC Transit Station
  - Shared Use/Transit-Oriented Development Parking Structure
  - Livestock Exchange Building/Flex Space

- New Arena
- CSU Center
- Colorado Commons
- Stadium Arena Market
- Future Transit-Oriented Development (depending on future orientation and uses, this property may require utilization of the RRSLs)

- **Lead and Arsenic Standards (exception to RSLs)** – As discussed in Section 1.5.5, the NWC is located within OU1 of the VB/I70 NPL. Generally, the residential properties addressed in this MMP have been evaluated by EPA as part of the NPL response for lead and arsenic impacts, and where impacts exceeded cleanup standards, soil removal actions have been completed. In several studies completed within the boundaries of the NWC supporting the subject redevelopment, concentrations of arsenic and lead exceeding the EPA CWRSLs, but below the VB/I-70 OU1 cleanup standards of 70 milligrams per kilogram (mg/kg) for arsenic and 400 mg/kg for lead, were detected (Appendix A). It has not been determined if these concentrations were the result of the I-70/VB Site, or resulted from other past industrial activities.

  The EPA did not require additional sampling/remedial actions at commercial properties. As interim and long-term use at the Site will generally be commercial, the DDPHE has determined that additional near-surface characterization of arsenic and lead will not be required, as that evaluation was not required by EPA. However, as a precaution, an arsenic value of 70 mg/kg, which was determined protective for residential property users by the EPA, has been adopted for this MMP. This concentration is considered conservatively protective as the future land use will be commercial. The lead standards for the VB/I70 Site and the RSLs are the same; therefore, the lead CWRSL will apply (800 mg/kg), except at the South Platte Riverfront, where the RRSL of 400 mg/kg will apply.

- **Hazardous Waste** – A material can be defined as hazardous based on definition (i.e., EPA F-Listed wastes) or based on characteristics such as corrosivity, ignitable, reactivity, or toxicity characteristics. A material may be defined as hazardous if any of the following criteria are met; however, additional criteria may apply as described in 6 CCR 1007-3 Part 261 Subpart D:
  - The material contains a listed hazardous waste (discussed in 6 CCR 1007-3 Part 261 Subpart D).
  - The pH is less than or equal to 2.0 or greater than or equal to 12.5; this material would be considered corrosive.
  - The flashpoint is less than 140 degrees Fahrenheit; this material would be considered ignitable.
  - The material is reactive.
  - Toxicity Characteristic Leaching Procedure (TCLP) results exceed the hazardous waste threshold.

- **20 Times Rule** - Waste Management (the operator of DADS) accepts solid material where concentrations as determined by the total analysis are less than 20 times the EPA Toxicity Maximum Concentrations of Contaminants; this is referred to as the "20 Times Rule". Polychlorinated biphenyls (PCBs) are an exception to this rule, as discussed in Section 6.8.3. As an example, the regulatory level for lead provided by the EPA Toxicity Maximum Concentrations of Contaminants is 5.0 milligrams per liter (mg/L) when analyzed by TCLP. The Waste Management acceptable limit, when analyzed by totals analysis, would then be less than 100 mg/kg, using the 20 Times Rule. If concentrations of any contaminant exceed the 20 Times Rule by

totals analysis, then analysis for TCLP is required. If the TCLP results exceed the toxicity characteristic maximum concentration, then the material would require disposal at a hazardous waste disposal facility in accordance with CDPHE requirements.

Note that all soil evaluation and disposition of soil must be confirmed and approved by DDPHE before disposal and/or reuse.

4.2 Soil Reuse Criteria

Details regarding various categories of soil use are presented in Sections below.

Note, any and all off-Site reuse of soil excavated from the Site requires DDPHE approval.

4.2.1 General Reuse Requirements

This project will follow the DDPHE *Guidance for Reuse of Soil on City Projects* (Appendix D). Additional requirements for specific types of soil use are described in the sections below in this document; however, some general requirements that apply to all reuse categories are described in this section including:

- Groundwater Protection Values must be met.
- If the soil would be reused at a third-party property, coordination with DDPHE will be required, as well as other requirements noted in the *Guidance for Reuse of Soil on City Projects* (Appendix D).
- If there is no place to reuse this soil on-Site and the material is characterized as non-hazardous and meets the waste acceptance criteria, it may be disposed at DADS with DDPHE approval, or at alternate off-Site locations with DDPHE approval (note that waste manifests or disposal tickets must be returned to DDPHE). The Contractor must select the option that is the best value to Denver.
- Soil that is proposed for reuse at a Denver-owned park must meet the requirements defined for Unrestricted Reuse materials; therefore, only soil that meets the criteria defined in Section 4.2.3 will be approved for reuse within a Denver-owned park.
- Soil that is not to be disturbed by planned construction on the project will remain in-place, regardless of its reuse classification. Characterization and remediation of soil not directly disturbed by project activities are beyond the scope of this MMP, unless specifically directed by DDPHE. In the event that remedial actions are required, additional planning would be conducted under the direction of DDPHE.

4.2.2 Use of Soil with Debris

Soil with debris cannot be reused on the project, or reused off-Site. Soil with debris that is characterized as non-hazardous and meets waste acceptance criteria will be taken to DADS landfill. If DADS cannot receive the waste, alternative facilities can be considered, but must be approved by DDPHE.

Certain materials are pre-approved by the CDPHE for beneficial use (Appendix E), such as reclaimed asphalt and reclaimed concrete, brick, and stone (non-asbestos bearing materials). In the event that these materials are identified, and are considered for reuse, confirmation with DDPHE about the end use must be obtained before reuse of these materials may occur.

4.2.3 Unrestricted Reuse of Soil

Soil with constituents of concern at concentrations within EPA RRSLs may be reused at residential, commercial, or industrial locations (either on- or off-Site), assuming:

- The receiving facility has knowingly agreed to accept this material
- The receiving facility has been provided and understands the analytical data
- Soil is free of construction/demolition debris and RACS

4.2.4 Non-Hazardous and Solid Waste Disposal

The Contractor, MMP Supervisor, and DDPHE must coordinate before the project begins to obtain DADS approval/waste profile, and waste manifests. It is possible that additional sampling may be needed to support a waste profile.

Disturbed solid waste including HUF and debris, and non-hazardous waste including geotechnically unsuitable soil or soil with constituents of concern at concentrations above EPA CWRSLs (not characterized as hazardous or liquids, see Section 4.2.4), must be transported off-Site to DADS. **These materials may not be reused on-Site. Possible beneficial reuses must be approved through coordination with DDPHE.**

DADS will accept solid material where concentrations as determined by totals analysis are less than 20 times the toxicity characteristic maximum concentration, this is referred to as the "20 times rule" (see Section 7.4). The EPA TCLP Maximum Concentrations of Contaminants are provided as Appendix C. At properties where lead was detected at concentrations above 100 milligrams per liter (mg/L) additional analysis of lead by TCLP indicated that lead was within the 5.0 mg/L regulatory limit; however, soil with constituents of concern exceeding the 20 times rule during the project will also require TCLP evaluation. It is expected that if soils encountered on this project exceed the CWRSL, they will likely be eligible for disposal as a non-hazardous waste.

Note: Certain waste streams are specifically excluded in the Solid Waste Regulations. The MMP Supervisor (and as approved by DDPHE) will be responsible for ultimate classification for disposal.

4.2.5 Hazardous Waste Disposal

If sample analysis indicates that the soil is designated as hazardous waste, the soil will be containerized immediately in a lined roll-off box or drum (for small amounts), labeled, and transported to a designated storage area (on Site) pending off-Site disposal at a hazardous waste disposal facility. Waste manifests must be completed for the material prior to transportation to the disposal facility in accordance with state and federal regulations. Once identified as hazardous waste, this material may not be stored on-Site longer than 90 days, and must be removed as soon as practicable. The Contractor, pending DDPHE approval, must coordinate disposal of any encountered hazardous waste via a licensed hazardous waste disposal Contractor and treatment, storage, and disposal facility (TSDF).

The Deer Trail Landfill operated by Clean Harbors Environmental at 108555 East Highway 36 in Deer Trail, Colorado is the only facility within Colorado licensed to accept hazardous waste. The next closest licensed hazardous waste disposal facilities are located in Nebraska, Utah and Texas. Manifestation and transportation of these waste materials on public highways, streets, or roadways will be in accordance with 49 Code of Federal Regulations (CFR) and any applicable Department of Transportation regulations.

5. Construction Water

Construction water may consist of stormwater, groundwater, and saturated soil, and will be addressed using the following procedures. Groundwater and saturated soil are not expected to be prevalent during this project, as demolition activities are expected to occur above the groundwater interface. Future post-enabling work may result in dewatering of groundwater; however, specific locations and needs have not been identified.

5.1 Stormwater

The Contractor is required to obtain all applicable permits related to construction stormwater compliance with either or both the CDPHE, or Denver, and implement best management practices and verify compliance in accordance with those permits. As applicable, Management Plans for demolition and construction activities must be developed and submitted to the Denver's permitting agency for review and approval prior to issuance of a Construction Activities Stormwater Discharge Permit (CASDP). Additional information may be found here:

https://www.denvergov.org/content/dam/denvergov/Portals/705/documents/guidelines/PWES-007.0-Construction_Activities_Stormwater_Manual.pdf.

5.2 Groundwater

It has been confirmed that PCE is present in groundwater throughout the project area (Figure 1), and low-level metals and PAHs may also be present. The current Ground Water Standard for PCE is 17 micrograms per liter (µg/L); Figure 1 denotes the extents of the plume to 10 µg/L. Further, it is possible that other chemicals may be present, either released from unidentified anthropogenic sources, or are present because of natural processes. Additional sampling may be required by CDPHE to establish baseline conditions, and establish discharge limits as applicable, should groundwater dewatering and discharge to waters of the State be proposed. As specific design has not been completed as related to certain NWC project elements, it is possible that additional planning is needed should water be displaced during the work.

Groundwater that may be encountered during subsurface construction activities will require sampling and analysis prior to discharge as part of the CDPHE-Water Quality Control Division (WQCD) permitting process. Water from dewatering operations shall not be directly discharged into any waters of the State, including wetlands, irrigation ditches, canals, or storm sewers, unless allowed by a permit. Unless prohibited by law or otherwise specified in the Contract, the water from dewatering operations shall be contained in basins in locations approved by the engineer, treated for discharge in accordance with the CDPHE-WQCD permit(s), or shall be hauled away from the project for proper disposal in accordance with applicable laws and regulations.

Evaluation of water disposition will be conducted in coordination with the MMP Supervisor and DDPHE. If results of sampling indicate that groundwater has been impacted at concentrations exceeding the appropriate CDPHE standard, **the Contractor must understand that the CDPHE will not allow this water to be discharged without appropriate permitting and/or treatment.** Previous sampling has confirmed the presence of PCE above Colorado Ground Water Standards.

In the event that groundwater is encountered, the Contractor will implement the most cost-effective method of groundwater handling and disposal that meets all state and federal regulations. If the Contractor intends to treat groundwater for discharge into waters of the State, it is likely that the Contractor will need to apply for and obtain a Remediation Activities Discharge to Surface Water permit COG315000 (Appendix F). If so, this application must be submitted at least 45 days prior to the anticipated date of discharge, and must be considered complete by the CDPHE before the CDPHE review and approval process begins. An application for remediation would need to concisely show how the Contractor intends to treat the water to meet the surface-

water standards applicable for the discharge. It is the responsibility of the Contractor to obtain all applicable CDPHE-WQCD permits for dewatering and discharge of groundwater, and to abide by the requirements of the permit(s). In the case that dewatering activities are required and a permit is obtained, the Contractor must prepare a Remediation Activities Management Plan (RAMP) prior to any discharge activities taking place. In accordance with permit procedures, the Contractor shall fill out and submit monthly Discharge Monitoring Reports (DMRs) to CDPHE-WQCD for the life of the permit, even if discharge activities are not conducted. Copies of monthly submittals shall be provided to Denver.

The following are some general provisions; however, requirements noted on the permit(s) take precedence over this MMP.

- The MMP Supervisor will notify DDPHE immediately if groundwater is encountered during construction.
- Untested groundwater or groundwater that does not meet the discharge standards will not be discharged onto the ground, or into sanitary or storm sewer, or any waters of the State.
- Groundwater that does meet discharge standards as evaluated by the MMP Supervisor may be discharged in accordance with applicable federal, state and local regulations, or may be used on-Site for moisture treatment of engineered fill material, or for dust suppression (assuming it meets Colorado Ground Water Standards). Use of groundwater for moisture treatment or dust suppression must be confirmed to be in compliance with water rights before implementation.
- Where chemical concentrations in groundwater are above permit limits, the water will be either be permitted and treated on-Site or transported off-Site and disposed at a licensed treatment facility.
- The MMP Supervisor will discuss treatment and/or disposal options with DDPHE, and DDPHE will provide direction to the Contractor, who will be responsible for water treatment and/or disposal in accordance with the Contractor's approved permits.

5.3 Saturated Soils

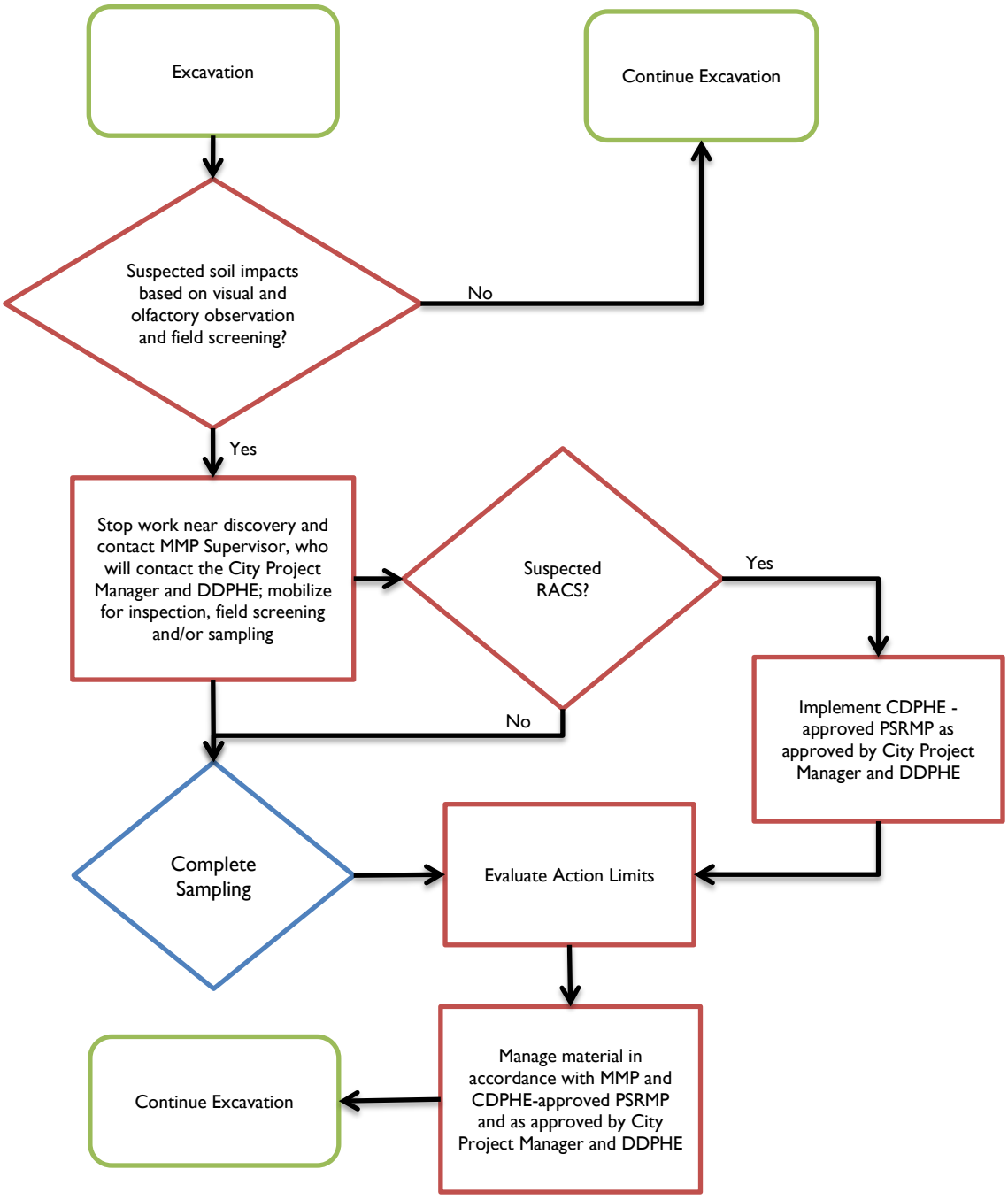
Materials excavated from below the groundwater table, such as soil that is saturated, may have the potential to generate liquids. If saturated materials are encountered, stockpile areas will be constructed to drain material before re-use as engineered fill, or transport for off-Site disposal.

Generated liquids will drain to a central sump which must be of sufficient capacity to prevent overtopping. The sump will be excavated into the ground and sloped to a central location. It will also be lined with 10-mil polyethylene sheeting; a layer of gravel will be implemented to hold the sheeting in place and will extend beyond the edge of the sheeting. A berm will be placed around the sump to prevent surface water from commingling with the generated water. Liquids accumulated within the sump will be submitted for analysis by the Contractor and coordinated with the MMP Supervisor. If constituents in the water exceed the surface water standards or CDPHE-WQCD permit limits (if applicable), the water must either be disposed at a licensed disposal facility with appropriate waste profiles and manifests or be treated to meet applicable standards before discharge (in accordance with the discharge permit). Solid wastes generated during this process must also be evaluated in accordance with sampling procedures prior to disposal; if this material will require disposal off-Site, it must pass the paint filter test (U.S. EPA Method 9095A) prior to disposal at a licensed solid waste disposal facility.

6. Material Response Requirements

6.1 Process Flow

The following process-flow chart presents the general process that will be followed during excavation activities.



6.2 Field Screening

6.2.1 Looks Bad, Smells Bad

This is the first and primary level of field screening that will be conducted at the Project. Appendix A details the studies that have been conducted; the potential for encountering materials of concern are documented therein. The MMP Supervisor will visually evaluate soil for the presence of suspected impacts, specifically for:

- Man-Made Fill: Visual evidence of man-made fills, particularly soil that contains debris, coal fines, concrete, brick, lumber, animal wastes, rendering wastes, drums, etc. Any soil that contains evidence of debris must be screened further by the MMP Supervisor and/or the CABI.

- Staining: Visual evidence of discoloration or staining in soil that obviously contains an abundance of substances that are not indicative of native soils in the area, such as black or gleyed (i.e., dark grey or greenish staining) soil.

- Odor: Olfactory (smell) evidence of impacts, such as noticeable petroleum or solvent odors.

Project personnel will assess excavated soil for visual and olfactory indications of potential impacts. Soil where visual or olfactory impacts are observed must be screened with field instrumentation by the MMP Supervisor to determine suitability for reuse or off-Site disposal. If potentially impacted soil is identified, excavation in proximity to the impacted area will then only continue under the observation of the MMP Supervisor, and with the approval of the DDPHE. The utmost care should be taken to separate "clean" soil from potentially impacted soil.

The requirement to remove all impacted soil will be determined and directed by the DDPHE, in coordination with the MMP Supervisor and the Contractor. As needed, parcel or pad-specific remediation plans may need to be developed. Once the MMP Supervisor confirms that excavation has transitioned into clean soil and potentially impacted material is no longer being excavated, the stockpiled material will be sampled for characterization and waste disposal purposes as described in Section 6.3.

6.2.2 Debris/HUF Materials

Visual monitoring of excavated soil shall be completed during project excavation activities by the CABI on a full-time basis. If the CABI determines that no debris is present, s/he may leave the excavation area but must be ready to remobilize to the area to evaluate soil if debris is observed by the Contractor. In that case, if debris is identified, then the Contractor must stop work, stabilize and secure the area, and contact the MMP Supervisor and CABI immediately.

6.2.3 Landfill Gas

Methane has been identified near and within the project area; therefore, field monitoring for landfill gases (methane, carbon dioxide, or hydrogen sulfide) will be required within the 500-foot buffer as noted on Figure 1. The MODCP (Appendix B) details monitoring and abatement requirements.

6.2.4 Field Instruments

Field instruments will be utilized on an as-needed basis, particularly if petroleum- or solvent-impacted soil is suspected. A photoionization detector (PID) or flame ionization detector (FID) (related to heavy petroleum hydrocarbons such as oil or grease) may be used in the field to screen for non-specific volatile organic

compounds (VOCs). If PID/FID concentrations exceed 50 parts per million (ppm) above background conditions, sampling will be required.

6.3 Soil Sampling

In general, soil sampling is not required unless visual/olfactory conditions indicate that an environmental condition may be present during the subsurface excavation. That is, unless soil has been identified that "Looks Bad, Smells Bad," sampling and additional evaluation by the MMP Supervisor is not required. However, given the legacy of Site uses and the high potential for impacts to be identified, the MMP Supervisor and CABI must be present during all soil-disturbing activities on the Site.

Samples described below are four-point composite samples and will be collected from stockpiled soil, or at the discretion of the MMP Supervisor and/or the DDPHE at the source of the discovery. Sample collection will be performed in a manner that is representative of the majority of soil to be handled at the location of the discovery.

Where sampling is deemed necessary by the MMP, samples will be analyzed for the following:

- VOCs by EPA Method 8260
- PAHs by EPA Method 8270
- RCRA eight metals using EPA Method 6010/6020/7471
- TCLP, as required based on the results of the totals analysis and the 20 Times Rule
- Pesticides/PCBs using EPA Method 8082

The DDPHE may adjust analysis requirements at its discretion.

6.4 General Soil Stockpiling Requirements

Soil that may be impacted, based on evaluation completed by the MMP Supervisor, and that has been disturbed during excavation activities, must be temporarily stockpiled on 6 mil plastic sheeting and covered pending receipt of the results of laboratory analysis in accordance with the soil sampling protocols identified in this document. Stormwater best-management practices (BMPs) as identified must be applied to the stockpiles of potentially impacted material to prevent contact with stormwater runoff and erosion. Stockpiles of potentially impacted soil will be limited to a maximum of 500 cubic yards each. All other soil must be handled in accordance with the Stormwater Management Plan (SWMP). This general stockpiling requirement does not apply if RACS is suspected or confirmed to be present (see Section 6.6)

6.5 Historical Urban Fill Areas

HUF areas, including areas where historical buildings once occurred, are a recognized environmental condition at several locations as noted on Figure 1. **All HUF and debris, regardless of location, must be screened by a CABI for potential RACS.**

6.5.1 Solid Waste

Solid waste may include soil mixed with non-RACS debris, municipal solid waste, manure, rendering wastes, putrescible waste, or other non-soil entrained debris. Solid waste must be confirmed asbestos-free by the CABI, and non-hazardous by the MMP Supervisor through sampling and/or observation. It is assumed that any solid waste disturbed during work that doesn't contain or is not suspected of containing other impacts (e.g., chemical impacts or RACS) is not suitable for reuse at the Site, and therefore will be disposed at DADS. Sampling to support a waste profile may be required by DDPHE and/or DADS.

6.5.2 Soil Vapors

Soil vapors may be impacted with migrating methane gases from the nearby HUF facilities. Therefore, all subsurface work within 500 feet of the HUF facilities requires implementation of the MODCP (Appendix B), and implementation of design considerations discussed therein.

6.6 Regulated Asbestos-Contaminated Soil

The Contractor is responsible for preparing a PSRMP, which will be subject to review and acceptance by the DDPHE and the CDPHE. If suspect HUF, debris, household waste, or RACS is encountered, the Contractor shall immediately stop work, secure the work area, and contact the MMP Supervisor and the CABI to evaluate the situation. Implementation of the PSRMP will be conducted as appropriate.

Oversight and documentation of RACS shall be conducted by a CABI who meets the training requirements as defined in Section 3.3 of this MMP. A minimum of one CABI will be present full time when general excavation activities are occurring. When HUF or debris is encountered, a CABI must be present during excavation at all times and at each work location where these materials have been identified. All RACS management will be performed by a Contractor capable of meeting the requirements in Section 5.5 of the Solid Waste Regulations, as documented by a CABI. If suspect RACS is discovered, the critical requirement is to avoid cross contamination and generating or being in direct contact with airborne dust; work shall stop immediately upon discovery. Notification must be made to the MMP Supervisor and DDPHE immediately.

RACS must be characterized and managed accordance with the PSRMP, and Section 5.5 of the Colorado Solid Waste Regulations.

ACM associated with buried utilities may be addressed under provisions of the CDPHE Regulation No. 8 – Part B, Asbestos. Confirmation with DDPHE will be required to address how RACS or other ACMs will be mitigated, if encountered.

6.7 Regulation No. 8 Asbestos-Contaminated Materials

Asbestos may be associated with intact structures, even if buried, that could be regulated by Regulation No. 8, Part B – Asbestos, by the CDPHE Air Quality Control Commission (AQCC). This regulation is separate from Section 5.5 of the Solid Waste Regulations, which regulates RACS. Examples of "Regulation No. 8" materials include buried asbestos-containing transite water pipes, steam lines, buried petroleum pipelines, and magnesia block-insulated utilities. All above-ground assessment and abatement of asbestos (i.e., in buildings) will occur separately from the planned work associated with this MMP. If suspect ACMs are identified, whether RACS or Regulation No. 8 materials, work will stop immediately, the work area will be secured and stabilized, and the CABI will be notified.

6.8 Special Wastes

Although not anticipated, other special wastes could include items such as drums, chemical or fuel containers, slag, coal, ash, biological waste, potential polychlorinated biphenyls- (PCBs) containing electrical equipment (transformers, light ballasts, voltage regulators, capacitors and circuit breakers), batteries, tar, and sludge. These materials may be present in small quantities and can be difficult to characterize. Upon identification of special wastes, excavation at that location will cease until additional assessment by the MMP Supervisor can be completed, and DDPHE is contacted. The MMP Supervisor will attempt to assess special wastes based on prudent and safe observation of the following:

- Handling of any special wastes will only be conducted under the direction of the MMP Supervisor and will be minimized whenever possible.
- If it is safe to move, special waste will be containerized or be placed on polyethylene plastic sheeting and covered, until additional assessment has been completed by the MMP Supervisor (the time frame will allow for laboratory testing and obtaining a profile and manifest for disposal).
- The special waste will remain covered or containerized until final removal.
- Stockpile requirements as described in Section 6.4 will apply and stockpile areas will be secured to prevent contact with unauthorized personnel and the public.
- The material will be characterized in accordance with the MMP, and manifests will be obtained before it is disposed of off-Site, and the material will be disposed of as soon as possible. If additional assessment of this material indicates that the material does not meet applicable regulatory requirements for disposal as a non-hazardous waste, the MMP Supervisor will arrange for off-Site disposal at a licensed hazardous waste facility, or other appropriate disposal Site after DDPHE approval.
- Special wastes that are generated will be managed in accordance with applicable local, state and federal regulations.
- Where potentially impacted material is determined to be non-hazardous by the MMP Supervisor, the material may be disposed of as non-hazardous solid waste at DADS.

6.8.1 Drums or Waste Containers

When drums or waste containers are identified, the Contractor must make note of the any of the following conditions and notify the MMP supervisor and DDPHE:

- Indications of unsafe conditions, including swelling drums, leaking, fumes, odors, etc.
- Markings and or labels on containers/drums, condition of the containers/drums (e.g., rust, holes, damage, corrosion) and other indications of contents.
- Pressurized/swelling drums, suspected explosives, potentially shock-sensitive materials or other potentially dangerous items will not be handled until a person with appropriate experience with these situations has been consulted.

6.8.2 Slag, Coal, Ash

Slag, coal, or ash cannot be reused on the project and will be disposed at DADS unless the waste does not meet the DADS waste acceptance criteria (i.e., fails TCLP analysis). These materials should be sampled in accordance with the requirements to dispose of the material at the DADS landfill. If the material cannot be accepted at the DADS landfill, additional sampling may be required by the alternate receiving facility. Ash is frequently associated with RACS and must be managed in accordance with the PSRMP.

6.8.3 Electronic Equipment (PCBs)

If any potential electrical equipment (including transformers, light ballasts, voltage regulators, capacitors and circuit breakers) suspected of containing PCBs is identified, it will be segregated, analyzed, and depending on PCB concentrations, transported off-Site for disposal at a PCB-permitted disposal facility, if necessary, or, ideally, recycled properly. Until testing is completed, any electrical equipment visually identified during excavation will be assumed to contain PCBs. Equipment where the absence of PCBs has been verified may then be disposed as solid waste, or recycled. Waste Management will accept materials where PCB concentrations are less than 50 parts per million. If this material will be disposed at DADS, the MMP Supervisor will work with DDPHE to complete a WM PCB Certification, which must include copies of analytical reports confirming the PCB concentrations.

6.8.4 Biological Waste

Biological waste includes the following types of waste specified in Colorado Solid Waste Regulations 6 CCR 1007-2, Section 13:

- Biohazardous waste
- Blood and body fluids
- Infectious waste
- Medical waste
- Pathological waste
- Pharmaceutical waste
- Potentially infectious waste

Biological wastes are regulated as solid waste under Colorado Solid Waste Regulations 6 CCR 1007-2 Section 13. Biological wastes should not be handled and work should be shut down upon discovery of biological waste. The Contractor must contact the MMP Supervisor and DDPHE and wait for the appropriate support personnel and evaluation prior to continuing work.

6.8.5 Rendering Waste

Although not identified during subsurface investigations, due to the long legacy of animal processing, it is possible that buried rendering wastes or other animal parts may be encountered during subsurface work. It is expected that this condition would result in putrid emissions; therefore, implementation of odor controls according to the MODCP may be required. Once identified, the MMP Supervisor, DDPHE and DADS would coordinate a waste profile for landfill disposal of rendering wastes.

6.8.6 Underground Storage Tanks

It is possible that USTs may be discovered during demolition activities. USTs in the project area may have been utilized for retail sales (e.g., gas stations), commercial uses (e.g., new or used oil), or for storage of heating oil (e.g., for firing a boiler). The following sections detail the activities that will be conducted, should a UST be discovered, and the activities needed to remove the UST in accordance with Colorado Department of Labor and Employment, Division of Oil and Public Safety (OPS) requirements.

6.8.7 UST Discovery

Immediately upon the suspected discovery of a UST or UST component (e.g., product delivery line), the Contractor shall stop work, secure the work area, and contact the MMP Supervisor and DDPHE. Reasons to believe that a UST may be present include: the visual identification of dispensers or dispenser islands; presence of vertical vent pipes; identification of filler ports; discovery of buried product delivery lines (constructed of either steel or fiberglass); the presence of buried tank(s) uncovered during excavations; or, suspected release of petroleum hydrocarbons based on visual staining, odor, or elevated field instrumentation (e.g., PID). After the Contractor discovery and notification, the MMP Supervisor and DDPHE will initiate further evaluation of the presence of the UST, suspected releases, sampling, necessary notifications to the OPS, and evaluate removal alternatives and plans.

6.8.8 UST Closure/Removal

UST closure/removal activities must conform to the OPS Storage Tank Regulations (7 CCR 1101-14), dated May 1, 2017. All closure/removal activities will be coordinated closely with the MMP Supervisor and DDPHE, and may require the development of a Site-specific work plan before removal actions may be initiated. If the Contractor is selected to remove the UST, the work plan preparation will be the responsibility of the Contractor. The work plan will detail notification requirements (to DDPHE, OPS and the Denver Fire Department), means and methods, sampling protocol, responsibilities, and information regarding applicability/cost recovery from the Petroleum Brownfields Program (where applicable). If the Contractor is selected to remove the UST(s), the Contractor must have demonstrated experience in the process, and be approved by DDPHE before undertaking UST-removal operations. The following resources should be reviewed by the Contractor to help in the development of the work plan for UST removal activities:

- OPS Petroleum Program Guidance: http://www.coworkforce.gov/petroleumguidance/
- Petroleum Brownfields Program: https://www.colorado.gov/pacific/ops/Fund
- American Petroleum Institute Recommended Practice 1604, *Removal and Disposal of Used Underground Petroleum Storage Tanks*
- American Petroleum Institute Publication 2015, *Cleaning Petroleum Storage Tanks*

DDPHE may, at their discretion, take the lead in the UST removal through other contracting mechanisms at its disposal.

DDPHE will determine oversight responsibilities related to UST removals. If the MMP Supervisor is qualified, this may be the MMP Supervisor, with DDPHE approval. Alternatively, the DDPHE may select another entity to conduct oversight activities, at its discretion. Upon DDPHE approval, the MMP Supervisor will observe the UST closure activities, collect applicable samples, and prepare closure reports per OPS requirements. Depending on the work plan, the Contractor will prepare notifications to the OPS/Denver Fire Department, remove the contents of the tank, verify the tank is inert, provide all necessary equipment and qualified

operators, remove the tank, and recycle/dispose of the tank. Again, details of the means and methods will be presented in the work plan, which will be approved by DDPHE before work commences.

Should a release be suspected or confirmed, DDPHE will provide the applicable OPS. Remedial actions, if necessary, would be conducted under the direction of DDPHE, separately from this MMP, per OPS requirements.

6.8.9 Structures Such as Pipelines

It is possible that unplanned discovery of pipelines will occur during subsurface work. The Contractor must contact Colorado 811 (Utility Notification Center of Colorado) to have public buried utilities located before any excavation occurs. If an unmarked structure or utility is discovered, the Contractor must contact the MMP Supervisor and the Denver Project Manager to evaluate the next steps, which may include evaluation of abandonment, or removal.

6.8.10 Void Spaces

It is possible that below-grade vaults, manways, or other subterranean structures will be discovered during construction. In coordination with the MMP Supervisor and the PM, the Contractor will work to uncover and evaluate the nature of the void. Care will be taken to control the work area and stage personnel and equipment a safe distance from any ground openings. Depending on the nature of the discovery, additional actions may be necessary including evaluation by a CABI (for instance, if subsurface steam tunnels are discovered), or structural/geotechnical engineers. Additional actions may be done under the approval of the Project Manager, which may include removal, or abandonment. Engineering (structural or geotechnical) may be necessary to address this issue.

6.8.11 Human Remains

If bones of potential human origin are discovered during construction, ground-disturbing work must be stopped near the discovery, and the Denver County Coroner (720-337-7600), the Denver Police (720-913-0400), and the Colorado State Archaeologist (303-866-2736) will be promptly notified. Work cannot resume in the vicinity of the find until clearance is granted.

7. Additional Requirements

7.1 Dust

A Methane, Odor, and Dust Control Plan (Appendix B) details the dust monitoring and abatement requirements for this project. In accordance with 5 CCR 1001 – AQCC Regulations, the Contractor will obtain an Air Pollution Emissions Notice (APEN) and Application for Construction Permit, where applicable. The Contractor will implement best management practices to minimize dust.

The Contractor will take reasonable measures to prevent particulate matter from becoming airborne and to prevent the visible discharge of fugitive particulate emissions beyond the property boundary on which the emissions originate. The Contractor shall provide sufficient quantities of equipment and personnel for dust control to prevent dust nuisance on and about the Project area. Blowing dust and airborne particulates shall be controlled by wetting or other means, if approved by the MMP Supervisor and the Denver Project Manager. Dust control agents shall be applied in accordance with manufacturer's recommendations. The measures taken must be effective in the control of fugitive emissions at all times in the Project area, including periods of inactivity such as evenings, weekends, and holidays as well as any other periods of inactivity.

The Contractor will also comply with the requirements put forth in the City and County of Denver Code of Ordinances Title II Revised Municipal Code Chapter 4 Air Pollution Control Article III Stationary Sources presented § 4-25. Fugitive Particulate Emissions; these requirements are presented in detail in the MODCP (Appendix B).

7.2 Decontamination of Heavy Equipment

Equipment that has come into contact with potentially impacted waste as identified by the MMP Supervisor will be decontaminated prior to leaving the Project area to prevent impacted material and/or soil with nuisance weed seeds from being spread off-Site. Gross removal of material from equipment will be completed using hand tools such as shovels, brooms, and brushes. If the MMP Supervisor finds it necessary, more thorough decontamination may be required such as pressure washing. Spent decontamination water will be collected in basins and pumped into water containers. The Contractor will be responsible for analyzing the waste-water and working with the MMP Supervisor and Denver Project Manager to evaluate final disposal options in accordance with applicable federal, state, and local regulations. A minimum of 10-mil polyethylene line shall be placed beneath equipment needing decontamination to collect residual materials and prevent unauthorized dispersal of liquids.

7.3 Site Security

The Contractor will be responsible for maintaining effective access control for the Project in accordance with all NWC requirements for Site security.

7.4 Wells

If active groundwater monitoring wells or beneficial-use wells are encountered, special care will be taken so as not to disturb their structural integrity. If this is not possible, then the well will be properly abandoned and replaced after construction (if needed) as coordinated and conducted by the MMP Supervisor. The Denver Project Manager and DDPHE shall be notified and will coordinate abandonment wells.

7.5 Complaints

Any complaints received by the Contractor will be immediately reported to the Denver Project Manager and the NWCO Program Manager. Additionally, any environmental-related complaint, such as noise, odor, or dust, will be immediately reported to DDPHE. Complaints must be addressed within 24 hours.

8. Imported Materials and Site Stabilization

Any soils, including embankment and/or topsoil, brought to the Site must meet the Unrestricted Reuse Criteria.

For each source of imported embankment or topsoil:

- The Contractor shall assure and certify that unacceptable concentrations of constituents in the analyses described below in Section 10.1, including but not limited to those defined in the 40 CFR Part 261 Subparts C and D, and the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), Section 101(14) as amended, are not incorporated into the project as a result of importing embankment or topsoil materials.

- The Contractor shall submit such certification to DDPHE and the Project Manager, signed and stamped (or sealed) by one of the following:

    - A qualified environmental consultant

    - Certified Industrial Hygienist (CIH)

    - Certified Hazardous Materials Manager (CHMM)

    - Registered Professional Engineer (PE)

    - Certified Safety Professional (CSP)

    - Registered Environmental Manager (REM)

- Additionally, the material must be visually evaluated by a CABI, and be determined free of any confirmed or suspected RACS, solid waste, debris, and demolition materials.

- Recycled asphalt materials that will be utilized for interim stabilization do not require the above evaluations before being brought to the Site.

If Contractor source material for embankment or topsoil, originating outside of the project limits, is placed at the project and was not cleared through the sampling protocols described in Section 10.1, the Contractor shall remove the material from the project, dispose of it in accordance with applicable laws and regulations, and make necessary restoration. This work will be the sole burden of the Contractor.

The cost of complying with these requirements, including sampling, testing, and corrective action by the Contractor, will not be paid for separately, and shall be included in the work.

8.1 Sample Analysis and Frequency

For material to be imported to the Site, the material must be adequately characterized by sampling at least every 500 cubic yards (or alternative frequency as determined by DDPHE) and analyze those soil samples for, at a minimum:

- VOCs by EPA Method 8260

- Semi-Volatile Organic Compounds by EPA Method 8270

- Total Petroleum Hydrocarbons by EPA Method 8015
- Pesticides/PCBs by EPA Method 8082
- Herbicides by EPA Method 8151
- RCRA eight metals by EPA Method 6010/6020/7471
- Asbestos – if debris is found and if suspect asbestos-containing material is found in the debris (e.g., transite, ash, brick mortar, asphalt shingles)

The Denver DDPHE may adjust the frequency of sample analysis, and analysis requirements, at its discretion.

8.2 Imported Fill Documentation

Certification documentation shall be provided to the Denver Project Manager and DDPHE for approval prior to being brought to the project Site.

8.3 Site Stabilization

It is anticipated that after enabling activities are completed, the Contractor will be required to stabilize each property for interim uses (such as for open space or parking). Interim stabilization measures will include the placement and grading of topsoil and planting of native grasses, or the placement, grading, and compaction of recycled asphalt to a depth of no less than four inches. Site stabilization will be completed by the Contractor in accordance with the contract documents. All stormwater and/or air permitting and close out will be the responsibility of the Contractor.

9. Reporting

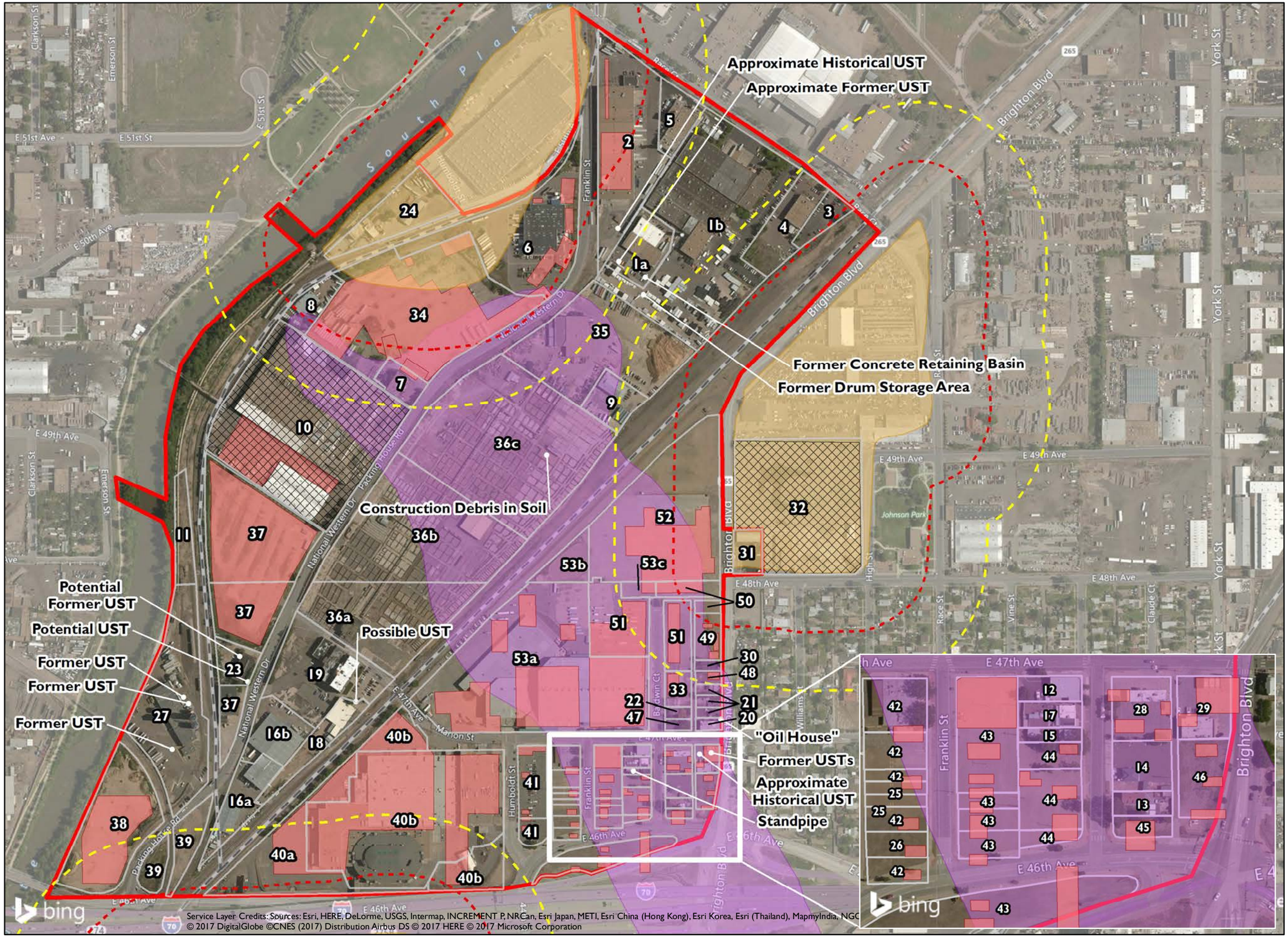
Upon project completion, the MMP Supervisor will prepare a summary report detailing the work performed at the project specifically related to the implementation of this MMP. The report will include the following:

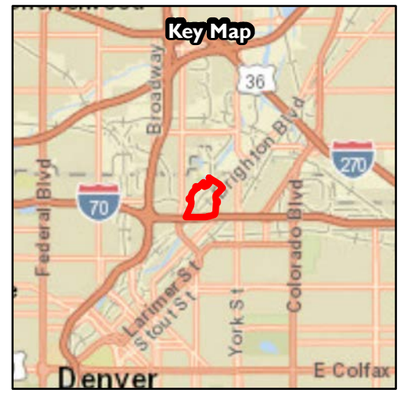
Detailed documentation of the on- or off-Site disposition will be maintained by the MMP Supervisor, including:

- Maps showing the locations of Site features related to this MMP, including sample locations, location of wastes discovered, and any other important features identified during the course implementation of this MMP
- Field Screening and analytical data
- Summary and copies of analytical results/reports
- Summary of quantities materials that were managed and the procedures used
- Location and manner (i.e., embankment fill, surface soil, etc.,) of soil use including any cover materials (soil, recycled asphalt, etc.,)
- Representative Site photographs showing soil reuse areas
- A reference to the proximity to groundwater (must meet requirements described in Section 7.1)
- Documentation or approvals for reuse of materials containing debris or soil categorized as Restricted Reuse
- Waste profiles and waste manifests for all solid waste, soil, water or other material transported off-Site for disposal
- Any records required under permits and a copy of all permits attained; including verification of closure of those permits (e.g., for the Construction General Permit [CGP] permit, copy of the Notice of Termination). Any other documentation detailing important features related to this project

CABI documentation to RACS management as required by Section 5.5 of the Solid Waste Regulations

Figures





Legend

- Study Area
- Historical Urban Fill
- High Probability of Methane
- Moderate Probability of Methane
- PCE Plume Limits for 10ug/L
- Historical Building
- Area Excluded from MMP
- Parcel Boundary
- Environmental Concern

1 inch = 400 feet

0 200 400 Feet

Pinyon Environmental, Inc.

ENVIRONMENTAL CONCERNS AND PARCEL REFERENCE MAP

Site-Wide Materials Management Plan
National Western Center Redevelopment Support
Denver, Colorado

Site Location: Sections 14 and 23, Township 3S, Range 68W, 6th Principal Meridian	Drawn By: JAF	Figure: 1
Pinyon Project Number: 1/17-007-06.8001	Reviewed By: BRP	Date: 12/21/2017

Document Path: \\PINYON10\Company2\PROJECTS\2017\11700706 NWSS Site-Wide Environmental Support\Figures\ArcMap\MXDs\REM01_Env Concerns and Parcel Ref.mxd

Appendices

Appendix A Parcel by Parcel Summary of Environmental Conditions and Oversight Requirements

Parcel by Parcel Summary of Environmental Conditions

Site Address	Figure Reference	Report Reference	Discussion	Environmental Concerns								Field Monitoring		
				Soil/Soil Vapor					Groundwater					
				VOCs	PAHs	Metals	RACS/ Debris	Methane/ Landfill Gases	VOCs	PAHs	Metals	Looks Bad, Smells Bad	PID	Methane/MODCP
5130 Franklin Street and 5125 Race Court	1a, 1b	Phase II Environmental Site Assessment, National Western Center Redevelopment Project, Rocky Mountain Colby Pipe, 5130 Franklin Street and 5125 Race Court, Denver, CO. Stantec, August 24, 2016.	Long industrial history, with documented petroleum and chemical releases, hazardous waste generation, and possible urban filling. Formerly operated large USTs used to store isopropyl alcohol, methyl ethyl ketone, toluene, and ethanol. Six soil borings/monitoring wells installed on the property, and evaluated for VOCs, SVOCs, RCRA 8 metals (total), and RCRA 8 metals (TCLP). One sample analyzed for PCBs. Soil: No detections above RSLs. Soil Vapor: Located within 500-foot buffer of HUF site. Groundwater: No detections above the groundwater standards. RACS: None identified, although potential urban fill has been reported.				•	•				•		•
5135 Race Court	2	Phase I Environmental Site Assessment, 5135 Race Court, Denver, Colorado. URS, February [sic] 2015.	Historical use for stockyards, and as a recycling facility. One UST was historically operated at the property; a release associated with the UST was closed in 1993. Soil: Former UST occurred near the scale house, although removal and confirmation sampling indicates no impacts. It is possible that residual impacts may remain. Soil Vapor: Located within 500-foot buffer of HUF site. Groundwater: Groundwater may be impacted with PCE from off-Site source, although recent PCE plume projections do not indicate it extends to this property. RACS: Possible historical building occurred on the property, which may have resulted in buried debris containing RACS at the property.	•	•		•	•				•		•
5100 Race Court	3	Phase I Environmental Site Assessment, 5100 Race Court, Denver, Colorado. Stantec, April 14, 2017.Phase II Environmental Site Assessment, National Western Center (NWC) Redevelopment Project, 5100/5115 Race Court, Denver, CO. Stantec, May 10, 2017.	The property is developed as a parking lot. Historically, the property was used as a stockyard. Soil: During a subsurface investigation, no impacts to soil were identified. Soil Vapor: No impacts were identified, although located within 500-foot buffer of HUF site. Groundwater: During a subsurface investigation, chlorinated solvents were detected at concentrations below the Colorado Ground Water Standards. 1,4-Dioxane was detected above the standard; the source of this chemical is likely up-gradient of this property.RACS: Unlikely					•	•			•		•
5115 Race Court	4	Phase I Environmental Site Assessment, 5100 Race Court, Denver, Colorado. Stantec, April 14, 2017. Phase II Environmental Site Assessment, National Western Center (NWC) Redevelopment Project, 5100/5115 Race Court, Denver, CO. Stantec, May 10, 2017.	The former Loomis Armored Inc. facility was located at 5115 Race, and maintained four USTs. A release was reported in 1990, and received closure in 1994. It is currently operated as a rug cleaning facility. A subsurface investigation has been completed, which included installation of three soil borings, of which two were converted into groundwater monitoring wells. One soil vapor well was installed. Soil: During a subsurface investigation, no impacts to soil were identified. Soil Vapor: No impacts were identified, although located within 500-foot buffer of HUF site. Groundwater: During a subsurface investigation, chlorinated solvents were detected at concentrations below the Colorado Ground Water Standards. 1,4-Dioxane was detected above the standard; the source of this chemical is likely up-gradient of this property. RACS Unlikely					•	•			•		•
5131 Race Court	5	Phase I Environmental Site Assessment for 5131 Race Court, Denver, CO. RMC, December 30, 2015.	This facility previously maintained four chemical USTs, that were used to store isopropyl alcohol, methyl ethyl ketone, toluene, and ethanol. All were removed in 1993. In August 1994, CDPHE issued a no further action letter indicating impacts from a prior release had been adequately addressed. It is possible that impacts could be discovered during subsurface work. Located within 500-foot buffer of HUF site.	•	•			•				•		•

Site Address	Figure Reference	Report Reference	Discussion	Environmental Concerns								Field Monitoring		
				Soil/Soil Vapor					Groundwater					
				VOCs	PAHs	Metals	RACS/ Debris	Methane/ Landfill Gases	VOCs	PAHs	Metals	Looks Bad, Smells Bad	PID	Methane/MODCP
5185 Packing House Road	6	Phase I Environmental Site Assessment Update, National Western Center Redevelopment Area, First Tranche, Crystal Packaging Company, 5185 Packing House Road, Denver, Colorado. Ninyo & Moore, December 23, 2016.	Historical industrial activity may have impacted the site as it was part of the former packing house operation based mainly on the property southwest of this property. Owner reported that coal ash dumping may have occurred on the west portion of the property. Buildings were once located on this property, that were reportedly razed between 1988 and 1991; it is not clear if hazardous materials were removed from these structures before demolition. A potential HUF has been mapped that extends into the western portion of this property. Low-level PCE is present beneath this property.	•	•	•	•	•				•		•
5001 Packing House Road	7	Phase I Environmental Site Assessment Update, National Western Center Redevelopment Area, First Tranche, Thomas R. Anthony Property, 5001 (AKA 5009) Packing House Road, Denver, CO. Ninyo & Moore, January 23, 2017.Limited Surface Soil Investigation Report, National Western Complex, 5001 Packing House Drive, Denver, CO. Ninyo & Moore, June 15, 2015.	The on-site building has been present since 1915. Two buildings were formerly present, but were demolished sometime around 1984-1988. Man-made fill is potentially located on this property, the disposition of which is not known. A limited surface soil investigation was completed, which included advancing five shallow soil borings on the property to a depth of one foot below the ground surface; 10 samples were collected from the borings and analyzed for total lead and total arsenic. Soil: Lead was detected in concentrations above the RRSL, but below the CWRSL. Soil Vapor: Located within 500-foot buffer of HUF. Groundwater: Low levels of PCE may be present.	•	•	•	•	•	•			•		•
5000 Packing House Road (West)	8	Phase I Environmental Site Assessment, National Western Center Redevelopment Area, Department of Agriculture Property, 5000 Packing House Road, Denver, Colorado. Ninyo & Moore, June 29, 2017.	This property historically was utilized as a hay barn, and is currently operated by the State of Colorado Department of Agriculture. Located within 500-foot buffer of HUF.					•				•		•
5000 Packing House Road (East)	9	Phase I Environmental Site Assessment, 5000 Packing House Road, Denver, Colorado. Stantec, April 14, 2017.Phase II Environmental Site Assessment, National Western Center Redevelopment Project, 5000 Packing House Road, Denver, CO. Stantec, May 10, 2017.	The site was used for stock pens, and subsequently by a fiberglass manufacturer, until 1987 when the building was destroyed by fire. It was most recently used by an insulation company for storage. The property formerly contained a 2,000-gallon UST which stored acetone. A subsurface investigation was completed, which included completion of two soil borings/monitoring wells, and one soil vapor well. Soil: VOCs and SVOCs were detected; however, the results were below RSLs. Lead and arsenic were also detected, but at concentrations below action levels. It is possible that remnant building debris of the early building that was destroyed by fire may be present in the subsurface. Soil Vapor: Methane was detected at concentrations below the lower explosive limit, although property is located within 500 feet of HUF. Groundwater: Most organic detections were below the Ground Water Standards; however, some PCE and vinyl chloride (a breakdown product of PCE) were detected at concentrations above the Ground Water Standard. It is believed that those concentrations are sourced up-gradient of this property. Metals were also detected at concentrations above the Ground Water Standards, but the source is believed to be up-gradient or naturally occurring metals.				•	•	•		•	•		•

Site Address	Figure Reference	Report Reference	Discussion	Environmental Concerns								Field Monitoring		
				Soil/Soil Vapor					Groundwater					
				VOCs	PAHs	Metals	RACS/ Debris	Methane/ Landfill Gases	VOCs	PAHs	Metals	Looks Bad, Smells Bad	PID	Methane/MODCP
4877 Packing House Road	10	Phase I Environmental Site Assessment, National Western Center Redevelopment Area, First Tranche, Le Mouton Noir Business Park, 4877 Packing House Road, Denver, CO. Ninyo & Moore, June 21, 2017. Limited Phase Off-Site Phase II Environmental Site Assessment, Le Mouton Business Park, Mid-America Plating, Denver, Co. Ninyo & Moore, August 29, 2017.	Property has a long industrial legacy, including for metal plating, finishing, and electroplating. Automotive repairs, and storage of potentially hazardous materials are also of concern at this property. Investigations have been performed near this facility, but not on the property due to access issues. Eight off-site soil borings, and three off-site soil vapor borings were installed. The eight borings were converted into groundwater monitoring wells. Soil: Results did not indicate impacts exceeding regulatory limits. Soil Vapor: PCE was detected in the subsurface at concentrations exceeding regulatory limits. Located within 500 feet of HUF site. Groundwater: Groundwater samples indicated the presence of PCE; however, these are likely related to the site-wide plume and not likely from a release at the property. Soil vapor analysis and modeling, however, may indicate a release of PCE on the property. Note that no samples have been collected from this property as of the date of the MMP.	•	•	•	•	•	•	•	•	•	•	•
900 East 48th Avenue	11	Phase I Environmental Site Assessment, National Western Center Redevelopment Area, First Tranche, Douglas L. McDonald Property, 900 East 48th Avenue, Denver CO. Ninyo & Moore, May 4, 2016.	No buildings have been constructed historically on this parcel, although railroad tracks have been present adjacent to this property since at least 1937. Stained soil has been observed on the surface, likely associated with historical railroad uses.		•	•						•		
1632, 1643 East 47th Avenue (also 4699 Baldwin Court)	12	Phase I Environmental Site Assessment, National Western Center Redevelopment Area, Second Tranche, 1632 East 47th Avenue, Denver, CO. Ninyo & Moore, July 28, 2016.	A drycleaner operated at this property in the 1950s. It is possible that chlorinated solvents may be present in soil at this property. Groundwater impacted with PCE from off-Site source, and possibly on-Site source.	•					•			•	•	
4656 Baldwin Court	13	Phase I Environmental Site Assessment, National Western Center Redevelopment Area, Second Tranche, 4656 Baldwin Court, Denver, CO. Ninyo & Moore, July 28, 2016.	Automotive repair operations have occurred at this property. Investigations have not been completed to confirm impacts. PCE present in groundwater from off-site source.	•	•	•			•			•		
4660 Baldwin Court	14	Phase I Environmental Site Assessment, National Western Center Redevelopment Area, Second Tranche, 4606 Baldwin Court, Denver, CO. Ninyo & Moore, July 28, 2016.	Groundwater impacted with PCE from off-site source.						•					
4667 Baldwin Court	15	Phase I Environmental Site Assessment, National Western Center Redevelopment Area, Second Tranche, 4667 Baldwin Court, Denver, CO. Ninyo & Moore, February 6, 2017.	A standpipe is present in the backyard, possibly indicating the presence of an underground storage tank (UST). Groundwater impacted with PCE from off-Site source.	•	•				•					
4680 and 4700 Packing House Road	16a, 16b	Phase I Environmental Site Assessment, National Western Center Redevelopment Area, First Tranche, 4680 & 4700 Packing House Road, Denver, CO. Ninyo & Moore, December 7, 2016.	Site formerly utilized for stockyards and a hay barn, and was redeveloped with the current structures in 1977. Drum storage was observed during a site visit, with staining present. Historical use at 4700 as a lumber company and hardwood manufacture may have resulted in impacts. The Denver Coliseum HUF may have impacted subsurface soil vapors, notably with methane, which could encroach onto the property.	•	•	•		•				•	•	•
4681 Baldwin Court	17	Phase I Environmental Site Assessment, National Western Center Redevelopment Area, Second Tranche, 4681 Baldwin Court, Denver, CO. Ninyo & Moore, July 28, 2016.	A drycleaner operated adjacent and north of this property; that use may have impacted the soil with chlorinated solvents (i.e., PCE). Groundwater impacted with PCE from off-Site source.	•					•			•		
4699 Marion Street	18	Phase I Environmental Site Assessment, National Western Center Redevelopment Area, First Tranche, 4699 Marion Street, Denver, CO. Ninyo & Moore, April 28, 2016.	Property developed since at least 1917 with current building. Uses have been stock yards, automotive service, and a UST has been utilized.	•	•	•						•	•	
4701 Marion Street	19	Phase I Environmental Site Assessment, National Western Center Redevelopment Area, 4701 Marion Street, Denver, CO. Ninyo & Moore, November 1, 2016.	This property has been developed since at least 1893 with the Center Building, and since at least 1920, developed with the current site buildings. The UST located near or on 4699 is proximate to this property boundary.	•	•							•		
4701 Brighton Boulevard	20	Phase I Environmental Site Assessment, National Western Center Redevelopment Area, 4701, 4709, 4717, 4727 Brighton Boulevard, Denver, CO. Ninyo & Moore, April 5, 2017.	Potential "oil house" located at the northeast corner of this property may have been used to store petroleum products (e.g., fuel oil), which could have resulted in the release of petroleum hydrocarbons in the subsurface. Groundwater impacted with PCE from off-site source.	•	•				•			•	•	

Site Address	Figure Reference	Report Reference	Discussion	Environmental Concerns								Field Monitoring		
				Soil/Soil Vapor					Groundwater					
				VOCs	PAHs	Metals	RACS/ Debris	Methane/ Landfill Gases	VOCs	PAHs	Metals	Looks Bad, Smells Bad	PID	Methane/MODCP
4709, 4717, 4727 Brighton Boulevard	21	Phase I Environmental Site Assessment, National Western Center Redevelopment Area, 4701, 4709, 4717, 4727 Brighton Boulevard, Denver, CO. Ninyo & Moore, April 5, 2017.	No indications that soil is impacted were identified. Groundwater impacted with PCE from off-Site source.						•					
4712 Baldwin Court	22	Phase I Environmental Site Assessment, National Western Center Redevelopment Area, 4712 Baldwin Court, Denver, CO. Ninyo & Moore, July 28, 2016.	An "oil pit" may have been used in the garage for automotive servicing; soil near this pit may have been impacted by petroleum hydrocarbons. Groundwater impacted with PCE from off-Site source.	•	•				•			•	•	
4747 Packing House Road	23	Phase I Environmental Site Assessment, National Western Center Redevelopment Area, First Tranche, 4747 Packing House Road, Denver, CO. Ninyo & Moore, May 20, 2016.Phase II Environmental Site Assessment, National Western Center Redevelopment Area, 4747 Packing House Road, Denver, CO. Ninyo & Moore, July 25, 2017	This property has been developed since at least 1929, and used for automotive repair. Areas were observed with multiple rusted drums, electrical equipment, and abandoned vehicles. Floor drains and a sand trap were also observed. Two USTs may also be located at the property. Soil: A subsurface investigation was completed, and 15 soil samples were collected and analyzed for VOCs, metals, and total petroleum hydrocarbons; select samples were also analyzed for PAHs, PCBs, and lead by TCLP. Elevated levels of arsenic were detected in some samples. Total petroleum hydrocarbons were detected in some soils at levels below and above threshold values. VOCs detected were below action levels. One PAH was detected at a concentration above the RRSL. Groundwater: Three groundwater samples were collected and analyzed for VOCs, RCRA 8 (Total) Metals, and one sample was analyzed for nitrates/nitrites and total Kjeldahl Nitrogen. Some metals were detected above the Ground Water Standards (which generally are compared against dissolved concentrations, so the results may be skewed high). Nitrate was detected above the Ground Water Standard. One VOC, trichlorofluoromethane, was detected above the Ground Water Standard.		•	•			•			•	•	
5055 West River Drive	24	Phase I Environmental Site Assessment, National Western Center Redevelopment Area, First Tranche, Denver Rock Island Railroad Property, 5055 West River Drive, Denver, CO. Ninyo & Moore, June 30, 2016.	This property has been used for industrial purposes since at least 1937. Oil staining on a concrete floor may be impacted by PCBs; soil staining was observed on soil on and around railroad tracks; stored railroad ties may have impacted soils; and adjoining property (and possibly this property) operated as an urban fill site. Soil: Petroleum hydrocarbons and wood preservatives may be present sourced from historical locomotive maintenance activities. Soil Vapor: Methane could migrate from the nearby HUF facility. Groundwater: Possible impacts from past activities.	•	•	•	•		•	•		•	•	•
4601 Franklin Street	25	Phase I Environmental Site Assessment, National Western Center Redevelopment Area, Second Tranche, 4601 Franklin Street, Denver, CO. Ninyo & Moore, September 22, 2017.	This property has been continuously undeveloped. Groundwater has been confirmed to be impacted with low-level PCE, sourced off-site.						•					
4645 Franklin Street	26	Phase I Environmental Site Assessment, National Western Center Redevelopment Area, Second Tranche, 4645 Franklin Street, Denver, CO. Ninyo & Moore, September 25, 2017.	A building historically occurred on this property, but was demolished in 2006. As this demolition occurred during a time where environmental regulations were in place with regards to asbestos assessment and abatement, no environmental concerns in soil were identified. Groundwater has been confirmed to be impacted with low-level PCE, sourced off-site.						•					

Site Address	Figure Reference	Report Reference	Discussion	Environmental Concerns								Field Monitoring		
				Soil/Soil Vapor					Groundwater					
				VOCs	PAHs	Metals	RACS/ Debris	Methane/ Landfill Gases	VOCs	PAHs	Metals	Looks Bad, Smells Bad	PID	Methane/MODCP
4647 Packing House Road	27	Phase I Environmental Site Assessment, National Western Center Redevelopment Area, Douglas L. McDonald Property, McDonald Farms, 4647 Packing House Road, Denver, CO. Ninyo & Moore, January 6, 2017.Limited Phase II Environmental Site Assessment, National Western Center Redevelopment Area, McDonald Farm Enterprises, Inc., 4647 Packing House Road, Denver, CO. Ninyo & Moore, July 26, 2017.	This property was historically used for stockyards, animal rendering and water treatment. Several RECs were identified, including use of USTs at the property, industrial uses, and possible coal-based fill. A Limited Phase II ESA was conducted. Seven soil borings were advanced using hand augers or a drilling rig, and four temporary groundwater wells were installed. Samples were evaluated for VOCs, PAHs, petroleum hydrocarbons, pesticides and metals. Groundwater was also analyzed for nitrates/nitrites/Kjeldahl nitrogen. Soil Results: Slightly elevated concentrations of lead were detected in a sample above the RRSL, but below the CWRSL. Chromium was detected in one sample exceeded the RRSL and CWRSL. DRO was detected above OPS threshold values. VOCs detected were below the RSLs. Low-levels of PAHs were detected. Pesticides were detected below the RSLs. Groundwater Results: Metals were detected but below the Ground Water Standards. No VOCs were detected in the samples collected. One PAH was detected at a concentration exceeding the Ground Water Standard. Nitrite/Nitrate/Kjeldahl were not detected at concentrations above Ground Water Standards. Based on these results, it was concluded that impacts from the former USTs are present on the northeast side of the on-site building, though the results were generally within established action levels. Soil near the surface and along the railroad right-of-way may be impacted with total chromium. Groundwater along the south side of the site of the building may be impacted from an up-gradient source with PAHs. Fill material was also reported, which contains brick and glass; it was not determined if suspect ACM was identified, although the presence of uncontrolled fill could contain RACS.		•	•	•			•		•	•	
1650 East 47th Avenue	28	Phase I Environmental Site Assessment, National Western Center Redevelopment Area, Second Tranche, 1650 East 47th Avenue, Denver, CO. Ninyo & Moore, July 28, 2016.	Groundwater impacted with PCE from off-Site source. Historically, residential structures occurred on this property that have since been demolished. There is a potential for RACS to be buried on this property.				•		•			•		
1670 East 47th Avenue	29	Phase I Environmental Site Assessment for 1670 East 47th Avenue, Denver, Colorado. RMC, May 31, 2016. Limited Phase II Environmental Site Assessment, National Western Redevelopment, 1670 East 47th Avenue, Denver, CO. Pinyon, October 18, 2016.	USTs have been removed, and a No Further Action letter was issued by OPS on September 7, 2017. However, a suspect historical UST may remain at the property. There is a potential that petroleum hydrocarbons could be encountered. Groundwater impacted with PCE from off-Site source. Petroleum hydrocarbons were not identified during subsurface investigations at the property. Historical building(s) may have resulted in buried debris containing RACS at the property.				•					•		
4741, 4747 Brighton Boulevard	30	Phase I Environmental Site Assessment for 4741 Brighton Boulevard, Denver, CO. Prepared by RMC Consultants, dated May 23, 2016	Groundwater impacted with PCE from off-Site source.						•					
4800 Brighton Boulevard	31	Phase I Environmental Site Assessment, 4800 Brighton Boulevard, Denver, CO. Stantec, April 29, 2016.	A gasoline UST formerly was used at the property, and a release was reported in 1989. Remedial activities were completed, and closure was granted in 1997. It is possible that residual impacts may remain. Automotive/truck repairs were completed historically at this property; these uses may have impacted the soil and/or groundwater at the site. Although the property is mapped as a suspect HUF, it was developed prior to and continuously since gravel mining/dumping occurred on the adjoining DPS site; therefore, HUF is not likely present. However, it is likely that this site is impacted with methane in the soil.	•	•	•		•				•		•

Site Address	Figure Reference	Report Reference	Discussion	Environmental Concerns								Field Monitoring		
				Soil/Soil Vapor					Groundwater					
				VOCs	PAHs	Metals	RACS/ Debris	Methane/ Landfill Gases	VOCs	PAHs	Metals	Looks Bad, Smells Bad	PID	Methane/MODCP
4850 Brighton Boulevard	32	Phase I Environmental Site Assessment, 4850 Brighton Boulevard, Denver, CO. Stantec, April 29, 2016. Phase II Environmental Site Assessment, DPS Bus Barn, 4850 Brighton Boulevard, Denver, CO. Stantec, August 1, 2016.	This is the Denver Public Schools property. This property is a confirmed HUF facility, with considerable buried municipal solid waste which is decomposing. As a result, methane gas is a significant concern at this property. Further, former USTs were maintained at and near this property. Three releases have been reported, which have been closed. It is possible residual impacts from petroleum hydrocarbons remain. Three soil borings were advanced in 2016, and were converted into groundwater monitoring wells. Additionally, four soil vapor points were installed. Soil: VOCs were either not detected, or results were below RSLs. Some PAHs were detected above the RRSL, but below the CWRSL. Metals were below action limits. No PCBs were detected. Soil Vapor: Several VOCs were detected above screening limits. Methane was detected at concentrations above the upper explosive limit. Groundwater: Three VOCs were detected at concentrations above the Ground Water Standards. Several PAHs were detected at concentrations above the Ground Water Standards. The metal arsenic was detected at concentrations above the Ground Water Standard.	•	•	•	•	•	•	•	•	•	•	•
4716 Baldwin Court	33	Phase I Environmental Site Assessment, Western Stockshow Association Parcels, National Western Center Redevelopment Area, Denver, CO. Ninyo & Moore, April 18, 2016.	Soil: None identified Groundwater: Groundwater impacted with PCE from off-Site source. RACS: Historically, residential structures occurred on this property that have since been demolished. There is a potential for RACS to be buried on this property.				•		•			•		
5011 Packing House Road (AKA 5009 Packing House Road, AKA 4701 Packing House Road)	34	Transaction Screen, National Western Complex Redevelopment, Terracon, March 13, 2015. Limited Phase II Environmental Site Assessment, National Western Center Redevelopment Project, Denver, CO. Terracon, March 22, 2016.	Prior uses confirmed as slaughter house, railroad, machine shop, oil room, engine room, fertilizer dryer, and lard refinery. As a result, subsurface investigation has been conducted, including installing two soil vapor wells, one soil boring, one monitoring well, and three excavated test pits. Soil: Low-levels of PAHs detected in one test pit. Elevated levels of total lead in soil in two test pits, at concentrations above residential RSL, but below Composite Worker RSL. Evidence of man-made fill with debris noted. Soil Vapor: Located within 500 feet of HUF. Groundwater: Low levels of PCE detected; low levels of dissolved arsenic detected		•	•	•	•	•	•		•	•	•
5012 Packing House Road	35	Transaction Screen, National Western Complex Redevelopment, Terracon, March 13, 2015. Limited Phase II Environmental Site Assessment, National Western Center Redevelopment Project, Denver, CO. Terracon, March 22, 2016.	Used for automotive repair shop with small amounts of paints/chemicals; two 1,000-gallon ASTs (gasoline and diesel). One soil boring/monitoring well installed on this property. Soil: Lead detected in near-surface soil at concentration above RRSL, but below CWRSL. Soil Vapor: Located within 500 feet of HUF. Groundwater: Low-levels of PCE detected in groundwater above Ground Water Standards.			•			•			•		
4800, 5010, 4875 Packing House Road	36a, 36b, 36c	Transaction Screen, National Western Complex Redevelopment, Terracon, March 13, 2015. Limited Phase II Environmental Site Assessment, National Western Center Redevelopment Project, Denver, CO. Terracon, March 22, 2016.	Possible current/historical automotive repair operations, as well as stockyard uses. Subsurface investigation has been completed on these parcels, including three soil vapor wells, one groundwater monitoring well, and three soil borings. Soil: No chemical concerns identified. Construction debris was identified in SB-14 on the 4875 parcel to a depth of 7 feet. Soil Vapor: PCE has been detected in the northwest corner of the 4875 parcel. A portion of Parcel 36c is within 500 feet of a HUF. Groundwater: Low-level PCE detected in the northwest corner of the 4875 parcel.					•	•			•		•

Site Address	Figure Reference	Report Reference	Discussion	Environmental Concerns								Field Monitoring		
				Soil/Soil Vapor					Groundwater					
				VOCs	PAHs	Metals	RACS/ Debris	Methane/ Landfill Gases	VOCs	PAHs	Metals	Looks Bad, Smells Bad	PID	Methane/MODCP
4701 Packing House Road	37	Transaction Screen, National Western Complex Redevelopment, Terracon, March 13, 2015. Limited Phase II Environmental Site Assessment, National Western Center Redevelopment Project, Denver, CO. Terracon, March 22, 2016.	Property was formerly utilized as a slaughter house/rendering facility. Other uses may have been a fertilizer operation, auto repair, and UST storage. Numerous buildings were razed between 1951 and 1968. A subsurface investigation has been completed, which included two soil borings, two test pits, one soil vapor well, and one groundwater monitoring well. Soil: PAHs and DRO detected at concentrations exceeding screening levels. Considerable debris noted in the subsurface, including metal, glass, wood, concrete and rebar. Soil Vapor: No concerns identified. Groundwater: Concentrations of PCE and arsenic below Ground Water Standards.		•	•	•					•	•	
901 Packing House Road	38	Transaction Screen, National Western Complex Redevelopment, Terracon, March 13, 2015. Limited Phase II Environmental Site Assessment, National Western Center Redevelopment Project, Denver, CO. Terracon, March 22, 2016.	Historically operated as large slaughter house/rendering facility. Subsurface investigation has been conducted, including one monitoring well, one soil boring, one soil vapor well, and five test pits. Soil: PAHs and petroleum hydrocarbons detected in samples, but results below action limits. Significant buried debris is present, which is a RACS concern. Soil Vapor: Detections at one location on-site not a concern; however, methane detected in very close proximity at elevated concentrations. Likely the result of municipal solid waste at the HUF south of I-70. Groundwater: No concerns detected.		•	•	•	•						•
1301 East 46th Avenue	39	Transaction Screen, National Western Complex Redevelopment, Terracon, March 13, 2015. Limited Phase II Environmental Site Assessment, National Western Center Redevelopment Project, Denver, CO. Terracon, March 22, 2016.	One soil boring and one soil vapor well were installed on this property. Soil: No soil concerns identified based on laboratory samples; however, soil was observed to be black and potentially impacted with somewhat elevated PID readings. Soil Vapor: Elevated methane detected, likely the result of municipal solid waste at the HUF south of I-70.		•	•		•				•	•	•
1101 East 46th Avenue and 4655 Humboldt Street	40a, 40b	Transaction Screen, National Western Complex Redevelopment, Terracon, March 13, 2015. Limited Phase II Environmental Site Assessment, National Western Center Redevelopment Project, Denver, CO. Terracon, March 22, 2016.	Limited petroleum storage noted; historical structures have been demolished at various locations across these parcels. Subsurface investigation has been completed, including installation of one monitoring well, five soil borings, and three soil vapor wells. Soil: Limited PAHs detected at one location, below RSLs. Only limited fill reported at the north portion of parcels; however, no test pits completed. Building debris may be present on these parcels. Soil Vapor: No concerns identified, although a confirmed HUF is present south of I-70 that may result in the presence of methane at these parcels. Groundwater: No concerns identified.				•	•				•		•
4638 - 4654 Humboldt Street	41	Transaction Screen, National Western Complex Redevelopment, Terracon, March 13, 2015. Limited Phase II Environmental Site Assessment, National Western Center Redevelopment Project, Denver, CO. Terracon, March 22, 2016.	Historical buildings were located on these parcels, which have been razed. Possible building debris is present. PCE is located beneath northern-most parcels, which is sourced off-site.				•		•			•		
4639 - 4695 Franklin Street	42	Transaction Screen, National Western Complex Redevelopment, Terracon, March 13, 2015. Limited Phase II Environmental Site Assessment, National Western Center Redevelopment Project, Denver, CO. Terracon, March 22, 2016.	Historical buildings were located on these parcels, which have been razed. Possible building debris is present. PCE is located beneath northern-most parcels, which is sourced off-site.				•		•			•		
4600 - 4658 Franklin Street	*43*	Transaction Screen, National Western Complex Redevelopment, Terracon, March 13, 2015. Limited Phase II Environmental Site Assessment, National Western Center Redevelopment Project, Denver, CO. Terracon, March 22, 2016.	Historical buildings were located on these parcels, which have been razed. Possible building debris is present. PCE is located beneath northern-most parcels, which is sourced off-site.				•		•			•		
4643 - 4665 Baldwin Court	44	Transaction Screen, National Western Complex Redevelopment, Terracon, March 13, 2015. Limited Phase II Environmental Site Assessment, National Western Center Redevelopment Project, Denver, CO. Terracon, March 22, 2016.	Historical buildings were located on these parcels, which have been razed. Possible building debris is present. PCE is located beneath northern-most parcels, which is sourced off-site.				•		•			•		

Site Address	Figure Reference	Report Reference	Discussion	Environmental Concerns								Field Monitoring		
				Soil/Soil Vapor					Groundwater					
				VOCs	PAHs	Metals	RACS/ Debris	Methane/ Landfill Gases	VOCs	PAHs	Metals	Looks Bad, Smells Bad	PID	Methane/MODCP
4646 Baldwin Court	45	Transaction Screen, National Western Complex Redevelopment, Terracon, March 13, 2015. Limited Phase II Environmental Site Assessment, National Western Center Redevelopment Project, Denver, CO. Terracon, March 22, 2016.	Historical building was located on this parcel, which has been razed. Possible building debris is present. PCE is located beneath parcel, which is sourced off-site.				•		•			•		
4661 Brighton Boulevard	46	Transaction Screen, National Western Complex Redevelopment, Terracon, March 13, 2015. Limited Phase II Environmental Site Assessment, National Western Center Redevelopment Project, Denver, CO. Terracon, March 22, 2016.	Historical buildings were located on these parcels, which have been razed. Possible building debris is present. PCE is located beneath parcels, which is sourced off-site.				•		•			•		
1655 East 47th Avenue	47	Transaction Screen, National Western Complex Redevelopment, Terracon, March 13, 2015. Limited Phase II Environmental Site Assessment, National Western Center Redevelopment Project, Denver, CO. Terracon, March 22, 2016.	Groundwater impacted with PCE from off-site source.						•					
4731 Brighton Boulevard	48	Transaction Screen, National Western Complex Redevelopment, Terracon, March 13, 2015. Limited Phase II Environmental Site Assessment, National Western Center Redevelopment Project, Denver, CO. Terracon, March 22, 2016.	Historical building was located on this parcel, which has been razed. Possible building debris is present. PCE is located beneath parcel, which is sourced off-site. Parcel located within 500 feet of HUF site.				•	•	•			•		•
4751 Brighton Boulevard	49	Transaction Screen, National Western Complex Redevelopment, Terracon, March 13, 2015. Limited Phase II Environmental Site Assessment, National Western Center Redevelopment Project, Denver, CO. Terracon, March 22, 2016.	Auto repair and wrecking historically occurred; three structures previously located on this property have been razed. Subsurface investigation has been completed, including installation of one monitoring well, and one soil vapor well. Elevated concentrations of arsenic detected in groundwater. It is possible that PCE is present on the western portion of parcel. Parcel is located within 500 feet of HUF site.				•	•	•			•		•
4701 Brighton Boulevard (near intersection of Brighton and 48th)	50	Transaction Screen, National Western Complex Redevelopment, Terracon, March 13, 2015. Limited Phase II Environmental Site Assessment, National Western Center Redevelopment Project, Denver, CO. Terracon, March 22, 2016.	No environmental conditions identified, although the northern portion of this parcel may be a portion of 4799 Brighton Boulevard, which may have RACS/building debris concerns. Located within 500 feet of HUF site.					•				•		•
4744-4780 Baldwin Court	51	Transaction Screen, National Western Complex Redevelopment, Terracon, March 13, 2015. Limited Phase II Environmental Site Assessment, National Western Center Redevelopment Project, Denver, CO. Terracon, March 22, 2016.	Historical buildings were located on these parcels, which have been razed. Possible building debris is present. PCE is located beneath parcels, which is sourced off-site. Located within 500 feet of HUF site.				•	•	•			•		•
4799 Brighton Boulevard	52	Transaction Screen, National Western Complex Redevelopment, Terracon, March 13, 2015. Limited Phase II Environmental Site Assessment, National Western Center Redevelopment Project, Denver, CO. Terracon, March 22, 2016.	Historical industrial complex used for animal slaughter/rendering. Subsurface investigation has been conducted, including two soil borings, three soil vapor wells, and one monitoring well. Soil: No detections exceeding regulatory values. Although not identified during investigation a large industrial facility has been demolished, sometime between 1993 and 1999. Soil Vapor: Elevated methane detected along Brighton Boulevard, likely sourced from DPS facility to the east of Brighton Boulevard. Groundwater: No concerns identified in sample collected; PCE may be present on western portion of parcel from up-gradient source.				•	•	•			•		•
4700 Lafayette Street, 4701 Franklin Street, 4785 Baldwin Court	53a, 53b, 53c	Transaction Screen, National Western Complex Redevelopment, Terracon, March 13, 2015. Limited Phase II Environmental Site Assessment, National Western Center Redevelopment Project, Denver, CO. Terracon, March 22, 2016.	Historical use for auto and truck repairs, camper manufacturing, gasoline tanks, railroad and demolition of numerous commercial and residential historical structures. Subsurface investigation has been completed, including two soil borings, three monitoring wells, and one soil vapor well. Soil: PAHs detected at concentrations below RSLs. Soil Vapor: No concerns identified. Groundwater: PCE present in groundwater sources from up-gradient.				•		•			•		

Appendix B Methane, Odor and Dust Control Plan

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Methane, Odor, and Dust Control Plan

National Western Center Redevelopment
Denver, Colorado

Prepared For:

City and County of Denver
200 West 14th Avenue, Department 310
Denver, Colorado 80204

Pinyon Project No.:

1/17-007-06

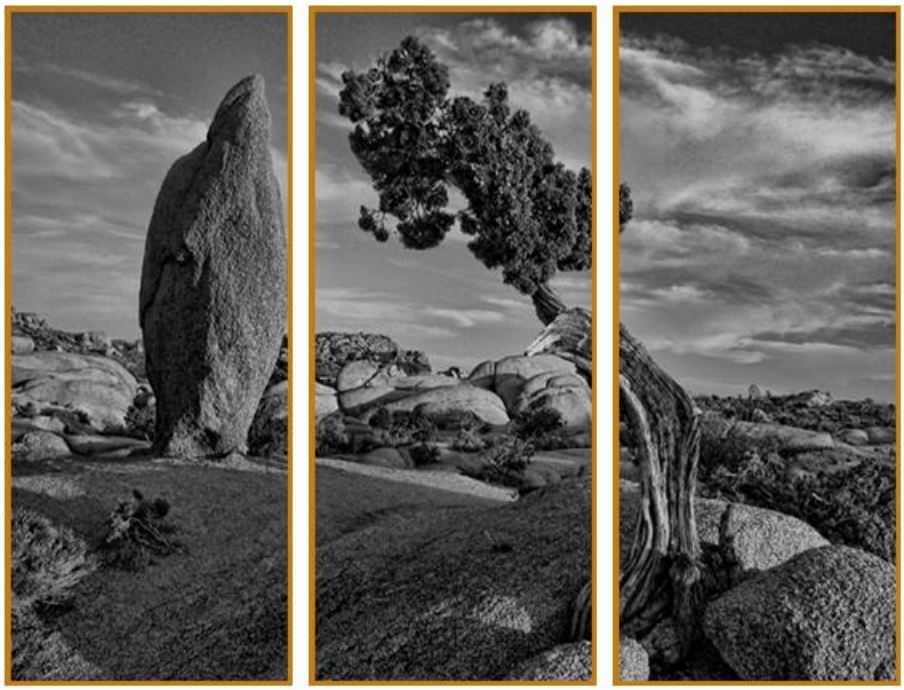

Table of Contents

1. Introduction

Pinyon Environmental, Inc. (Pinyon), has prepared this Methane, Odor, and Dust Control Plan (MODCP) for use during the planning and construction of improvements at the National Western Center (NWC) (MMP Figure 1). This MODCP has been developed to assist the future-selected Engineer and Contractor (Contractor) in recognizing the potential presence of combustible gases (primarily methane), odors, and fugitive dust. The Contractor is responsible for employing the proper personnel, monitoring equipment, and personal protective equipment (PPE) to provide a safe working environment for its employees, consultants, and subcontractors. As stated in the Materials Management Plan (MMP), the Contractor must develop a site-specific Health and Safety Plan (HASP) and designate a qualified Health and Safety Officer (HSO). The guidelines for methane, odor, and dust control presented in this MODCP are intended to be minimum guidelines which should be included in the HASP, but are not intended to be inclusive of all monitoring and control that may be required; the Contractor is required to provide a safe working environment for its employees and the public at all times.

This MODCP also presents design considerations that could be applied during engineering design activities to minimize the transmission of methane into and through the project area. Information regarding the Proposed Action, Site Description, and other project details are presented in the MMP.

1.1 Historical Urban Fill

Three HUF areas have been identified near the Site boundaries, including the DPS property northeast of the intersection of Brighton Boulevard and East 48th Avenue, the Denver Coliseum property south of I-70 and east of the South Platte River, and an unnamed fill within the northeast corner of the study area (MMP Figure 1). Methane in soil has been identified proximate to both the DPS and Denver Coliseum HUF areas; methane has not been thoroughly evaluated near the northeast fill area, but is suspected of being a concern.

Buffer areas have been added to MMP Figure 1, including a 250-foot buffer, and a 500-foot buffer. Areas within the 250-foot buffer are assumed to have a high methane risk below the surface; areas within the 500-foot buffer are assumed to have a moderate methane risk below the surface. "Risk" assumes both an explosion risk, as well as an asphyxiation risk. These buffers are offered as general guidelines; however, methane can travel laterally from an HUF through the path of least resistance, including loose or porous soil and utility corridors. This MODCP shall be implemented within all areas within the 500-foot buffer unless soil vapor sampling specific with a design element confirms that soil vapor is not a concern.

Methane can become explosive if it is present in sufficient concentration and comes into contact with an ignition source. Methane has a Lower Explosive Limit (LEL) of 5% by volume, and an Upper Explosive Limit (UEL) of 15% by volume.

1.2 Purpose and Objectives

It is the intent that this MODCP provide guidance for the monitoring of combustible gases, odors, and fugitive dust during Project activities, such as excavation, stockpiling, or loading transport trucks, which may release combustible gases, odors, or fugitive dust into the air. This MODCP is being submitted as part of the MMP for the Project. In the event that any discrepancy is noted between this MODCP, the MMP, and any applicable regulation, the regulation will take precedence, followed by the MMP, then the MODCP, unless a variance has been previously approved by the regulator.

The objectives of this MODCP are to identify:

- Relevant Occupational Safety and Health Administration (OSHA) exposure limits for combustible gases

- Potential releases of nuisance odors and identify the requirements of Regulation No. 2 of the Colorado Department of Public Health and Environment – Air Quality Control Commission (CDPHE-AQCC) and Article II of Chapter 4 (Air Pollution Control) of Denver's Municipal Ordinance Code
- Requirements for monitoring and control of fugitive dust emissions under Regulation No. 1 of the CDPHE-AQCC and Article III of Chapter 4 of Denver's Municipal Ordinance Code
- Design features which could minimize the subsurface transmission of methane or other landfill gases

2. Combustible Gas

Combustible gases, such as methane, are likely to be encountered during construction activities at the Site. The presence of methane poses several risks for the work environment, including, but not limited to oxygen depletion and explosion.

Under normal atmospheric conditions, oxygen concentrations should be between 19.5% and 22.0% by volume. The presence of methane will displace oxygen in an atmosphere, resulting in an oxygen-depleted atmosphere. If this oxygen-depleted atmosphere is inhaled by workers, the cells in the body are unable to receive sufficient oxygen; this is also known as asphyxiation. Asphyxiation results in confusion, unconsciousness, respiration and cardiac arrest, and possibly death. The oxygen content in the work zone will be monitored with an oxygen meter(s).

Methane is a combustible gas which forms an explosive mixture in air between 5% and 15% by volume. The primary risk associated with combustible gases and vapors is the possibility of explosions. Each individual combustible gas or vapor will ignite only within a specific range of fuel to oxygen mixtures. An ignition source could be the spark from static electricity, an electrical tool, or cigarette. If there is too much or too little combustible gas in an environment, it will not ignite. The LEL is the lowest concentration of a gas in an environment that is capable of producing a flash of fire in the presence of an ignition source. The UEL is the highest concentration of a gas in an environment that is capable of producing a flash of fire in the presence of an ignition source. Concentrations lower than the LEL are "too lean" to burn and concentrations above the UEL are "too rich" to burn. Concentrations in between the UEL and the LEL are considered flammable. A combustible gas indicator (CGI) is used to measure the percent LEL (% LEL).

2.1 Combustible Gas Monitoring

The primary health and safety concerns of methane are the risks of oxygen depletion and explosion. The risk of oxygen depletion will be monitored with an oxygen meter, and the risk of explosion will be monitored by use of a CGI. A CGI measures the combustible gas or vapor content in air. It provides a reading of %LEL. The meter must have the ability to detect the LEL of methane; methane gas has an LEL of 5%.

Oxygen content will be measured with an oxygen meter. Safe oxygen levels are between 19.5% and 22.0% The primary concern is an oxygen-deficient environment, where oxygen content is less than 19.5%. If oxygen levels are less than 19.5%, the area should be vacated and properly ventilated until levels become safe again or an alternate supply of oxygen is provided. In this event, additional requirements and monitoring by the HSO may be required.

Additional devices and supplies may include a two-way radio and cellular phone.

2.2 Combustible Gas Monitoring Procedures

At a minimum, the following combustible gas monitoring procedures will be implemented during the Project.

- A CGI will be utilized continuously to monitor air quality when excavating in areas with suspected methane contamination.
- Before personnel are permitted to enter an excavation or trench, the breathing space air will be monitored to ensure that combustible gas is not present greater than 10% of the LEL (0.5% of methane), and that the oxygen concentration is no less than 19.5%.

- When in an excavation or trench, each worker will wear a personal continuously operating CGI and oxygen monitor.
- Blowers or fans will be used to ventilate excavations or stockpiles that show CGI readings greater than 10% of the LEL for methane (0.5% methane) or an oxygen concentration less than 19.5%.
- When excavating or trenching into or adjacent to suspect urban fill material, and in the presence of combustible gas greater than 10% of the LEL (0.5% methane), necessary precautions should be enacted, such as the material will be wetted and the operating equipment will be equipped with spark-proof exhausts.
- Personnel within or near an excavation or stockpile will wear appropriate PPE, such as long pants, long sleeves, shoes with non-metallic soles, a hard hat, and safety goggles or glasses.
- No open flames will be permitted in any area within 100 feet of an excavation or stockpile.
- No smoking is permitted at the work Site.
- A dry chemical fire extinguisher, ABC rated, will be provided on all equipment used to handle suspect material.
- Personnel will remain upwind of an open excavation unless the excavation is continuously monitored and shown to have a CGI reading of 10% of the LEL (0.5% methane) or less and an oxygen content of 19.5% or more.
- All other applicable Safety and Health Regulations for Construction, as promulgated in 29 Code of Federal Regulation (CFR) by OSHA and as described in the contractor provided HASP, will be met (note, the MMP details the requirements of the HASP, and the requirement that the Contractor retain a HSO on the project).
- If working in a confined space, personnel will comply with OSHA's confined space requirements for general industry.
- If working in a trench, personnel will comply with OSHA's trench safety requirements.

2.3 Combustible Gas Monitoring Training

Workers responsible for monitoring levels of methane or other combustible gases must have a minimum of one year of experience with the operation, maintenance, and calibration of the hand-held meter(s) being used. Workers must also be current with OSHA training requirements under 29 CFR 1910.120. Workers will be responsible for adherence to applicable state and local regulations regarding health and safety training.

3. Odors

During Project activities, odors may be released from, and travel past, the Project area. Part A.1.A of the CDPHE AQCC Regulation No. 2 and Article II of Chapter 4 of Denver's Municipal Ordinance Code state a violation has occurred if:

- Odors are detected when one volume of odorous air has been diluted with seven or more volumes of odor-free (7/1 dilution) air in areas used predominantly for residential or commercial purposes.
- The DDPHE receives five or more complaints from individuals representing separate households or businesses within the city within a 30-day period relating to a single odor description, and the DDPHE verifies the source of the odor.

At a minimum, the following methods and procedures will be followed to comply with the above referenced regulations.

3.1 Odor Monitoring Methods

The primary concern with odor is the potential nuisance to residential or commercial properties outside of the Project area. The degree of odor nuisance will be a subjective determination made by the MMP Supervisor. Odor concentrations will be measured by certified personnel using a Barneby Sutcliffe Scentometer, a Nasal Ranger Field Olfactometer, or similar. The odor meter will be operated by a person who is a CDPHE-certified Odor Monitor, as detailed in this MODCP.

Additional devices and supplies may include a two-way radio, cellular phone, compass, wind director indicator, maps, and odor observation data sheets. Wind speed will be obtained from a hand-held anemometer.

3.2 Odor Monitoring Procedures

At a minimum, the following odor monitoring procedures will be implemented during the Project:

- Odor monitoring will occur along the boundary of the Project as well as adjacent public access. Monitoring will occur at positions along these boundaries that are down-wind from open excavations, material stockpiles, and truck-loading operations. When determining the source of an odor, it will be necessary to record the presence/absence/detectability of the odor at both up- and down-wind locations.
- One odor reading will be taken at multiple designated stops surrounding the Project. Designated stops should be identified by the HSO or MMP Supervisor. If an odor reading exceeds the 7/1 dilution-to-threshold (D/T) factor for concentration, a second reading will be taken. The two readings will be timed at least 15 minutes apart but within the same one-hour period.
- The Odor Monitor's vehicle will be shut off so that exhaust fumes do not influence the ability to detect odors. Exhaust or dust from nearby vehicles should be cleared before conducting the odor monitoring at the location.
- At least two to three minutes will be spent at each stop on the odor monitoring circuit to allow for minor wind shifts that may transport odors either toward or away from the location.
- The Odor Monitor will record the time, odor concentration, odor characteristics (type of odor), wind speed and direction, and meteorological conditions at each monitoring location on a monitoring form.

Meteorological conditions that may affect odor detection include temperature and humidity. Even if odors are not detected, the time and wind direction will be recorded regardless of the presence of odors.

- The Odor Monitor will collect and record odor readings in the form of dilution factors. For example, a dilution factor of 14/1 represents one part of odor at the actual concentration present diluted with 14 parts of odor-free air. A 0 reading indicates a non-detect, and 170/1 indicates a high dilution factor.
- The odor characteristics may be a short list of words such as "rotten eggs," "musty," "ammonium," etc.
- Odor Monitors will use the same log when recording data during the odor monitoring circuit. The log should include space for the time, numerical codes for odor intensity, odor characteristics, wind direction, and weather conditions.
- If the odor intensity is 0 or "not detectable" then it is assumed that the odor characteristic is "not applicable." Results will be documented completely.
- If the Odor Monitor discovers an odor that is attributable to Project activities, the MMP Supervisor will be notified immediately.
- If residents or business representatives approach an Odor Monitor while conducting the odor monitoring circuit, to complain about the odor at that location, the resident, business, or employee's complaint will be documented by the Odor Monitor regardless of whether the Odor Monitor verifies the odor at that location. The number of complaints will be tracked by the Odor Monitor and will be reported to the MMP Supervisor regularly, as well as when the number exceeds five within the 30-day time period specified in Denver's Municipal Ordinance Code.
- As indicated above, odor characteristics such as "rotten eggs," "musty," "ammonium," etc., will be monitored by the Odor Monitor. Project workers will also monitor for these and other types of odors. If the Odor Monitor or Project workers observe a persistent odor, they will notify the MMP Supervisor and request a second opinion. If confirmed, the MMP Supervisor will immediately increase the level of odor control measures.

3.3 Odor Monitoring Training

Odor Monitors must hold CDPHE certification as an Odor Monitor, which demonstrates that the individual is trained and certified to determine and grade odors in accordance with Regulation No. 2 and Denver's Municipal Ordinance Code.

4. Fugitive Dust

In accordance with 5 CCR 1001 – AQCC Regulations, the Contractor will obtain an Air Pollution Emissions Notice (APEN) and Application for Construction Permit for projects greater than 25 acres or greater than 6 months in duration. Regardless of the project size or need for an APEN permit, the Contractor will implement best management practices to minimize dust, such as the following.

The Contractor will take reasonable measures to prevent particulate matter from becoming airborne and to prevent the visible discharge of fugitive particulate emissions beyond the property boundary on which the emissions originate. The Contractor shall provide sufficient quantities of equipment and personnel for dust control sufficient to prevent dust nuisance on and about the Project area. Blowing dust and airborne particulates shall be controlled by wetting or other means, if approved by the MMP Supervisor and the CCD Project Manager. Dust control agents shall be applied in accordance with manufacturer's recommendations. The measures taken must be effective in the control of fugitive emissions at all times in the Project area, including periods of inactivity such as evenings, weekends, and holidays as well as any other periods of inactivity.

The Contractor will also comply with the requirements put forth in the City and County of Denver Code of Ordinances Title II Revised Municipal Code Chapter 4 Air Pollution Control Article III Stationary Sources presented § 4-25. Fugitive Particulate Emissions and administered by the DDPHE. Requirements are as follows:

No person shall allow or cause: (1) any materials to be handled, transported, or stored; (2) a building, including its appurtenances, or a construction haul road to be used, constructed, altered, repaired or demolished; or (3) any unenclosed activity, including demolition, excavation, backfilling, grading, clearing of land, construction or sandblasting without taking all reasonable measures as the DDPHE requires to prevent particulate matter from becoming airborne. All persons shall take reasonable measures to prevent the visible discharge of fugitive particulate emissions beyond the lot line of the property on which the emissions originate. The measures taken must be effective in the control of fugitive particulate emissions at all times on the site, including periods of inactivity such as evenings, weekends, and holidays as well as any other period of inactivity. Based upon the size of the construction site, proximity to sensitive receptors, or history of noncompliance with the provisions of this chapter, the DDPHE may require a fugitive particulate control plan for such activities.

(1) [Plan requirements.] The fugitive particulate control plan shall:

a. Be subject to DDPHE review, and if the DDPHE finds the plan to be inadequate, the DDPHE may require modifications.

b. Include the name and contact information of the person(s) responsible for the implementation of the plan and the person(s) responsible for the particulate generating activities.

c. Be effective in the control of fugitive particulates at all times, including evenings, weekends, and holidays, regardless of whether activities are being conducted at the site.

d. Identify each potentially fugitive particulate generating activity and operation to be carried out on the site and the actual and potential sources of fugitive emissions on-site.

e. Identify one (1) primary control measure and one (1) contingency control measure for each activity, operation or source of fugitive emissions identified above. A list of potential control measures may be obtained from the DDPHE.

f. Include at least daily vacuuming or wet sweeping of the right-of-way adjacent to individual projects to control any materials that are tracked out or that otherwise have come to be located in adjacent right-of-way.

g. Be implemented for the duration of the project.

(2) Fees:

a. The board may require by rule and regulation payment of nonrefundable fees to be paid upon submittal of a fugitive dust control plan. The fees are to be of amount sufficient to offset all costs associated with the fugitive dust control plan review, including costs of administration and enforcement.

b. All fees must be paid at the time of filing the application for review with the DDPHE. No application will be valid or complete until all fees have been paid.

4.1 Fugitive Dust Monitoring Methods and Procedures

At a minimum, the following fugitive dust monitoring procedures will be implemented during the Project.

- A Fugitive Dust Monitor will visually observe, or use a particulate meter to monitor for the presence of fugitive dust crossing the down-wind property boundary. Visual observations or use of the meter will be conducted by a person who is a certified Fugitive Dust Monitor, as detailed in Section 5.2 of this MODCP.
- The Fugitive Dust Monitor will monitor the wind direction to evaluate the up-wind and down-wind Project boundaries.
- If fugitive dust is observed, the Fugitive Dust Monitor will record the location, time, duration, characteristics (color, density, particle size, distribution), wind direction, and meteorological conditions on the monitoring form.
- If the Fugitive Dust Monitor identifies the source of the dust to be related to Project activities, they will notify the MMP Supervisor and record the information on the monitoring form. Appropriate corrective measures must be taken by the Contractor if visible dust is found to be originating from Project activities.
- If the Fugitive Dust Monitor identifies the source of the dust to be from a source up-wind of the Project, they will notify the MMP Supervisor and record the information on the monitoring form.

4.2 Fugitive Dust Monitoring Training

Fugitive Dust Monitors must have successfully completed an EPA Method 9 Certification training course, or have worked under a professional with this certification and be familiar with the fundamental variables that influence fugitive dust observations.

5. Response Actions and Control Measures

Response actions and control measures are required if combustible gas, odors, or fugitive dust are detected at levels which exceed screening limits. In general, the response actions are expected to be consistent with current industry best practices.

5.1 Combustible Gas (Methane)

If atmospheric concentrations exceed 10% of the LEL (0.5% methane), the control measures, such as operations must be suspended and heavy equipment shut-down, should be implemented until the source is identified and the level is 0% of the LEL. If levels do not decrease, field personnel and all other individuals in the vicinity of the activity must be directed to move to a safe area. If levels do not decrease and the source is not identified, the MMP Supervisor or HSO must alert the local fire department.

Meter	Reading	Action 1	Action 2
Oxygen	Less than 19.5%	Stop work and vacate	Ventilate area Or Provide alternate supply of oxygen
CGI	Exceeds 10% of the LEL (0.5% methane)	Stop work and vacate	Ventilate area

5.2 Odors

If odor is measured at the down-wind property boundary at a value greater than a 7/1 D/T, five or more community complaints are received, or overly obnoxious and persistent odors are being released from the Project area, Project activities believed to be contributing to the odor(s) will be identified and readily implementable response actions will be considered. Control measures may include:

- Minimizing the exposed surface area
- Applying water to working faces of the excavations
- Maximizing construction during periods of cooler weather
- Covering stockpiled material or the working faces of excavation

Should odor(s) persist, the Odor Monitor will inform the MMP Supervisor and CCD Project Manager for further discussions.

5.3 Fugitive Dust

If visible fugitive dust, originating from the Project area, crosses a Project boundary, the Fugitive Dust Monitor will notify the MMP Supervisor immediately. Project activities contributing to the release of fugitive dust will be shortened or terminated until a control measure can be implemented. Control measures are similar to those presented for odor control.

6. Communication and Reporting

Efficient and effective communications and reporting are necessary for providing information to the public concerning odor and fugitive dust monitoring results. Communication and reporting allows the Project team to make decisions to address concerns with methane, odors, and fugitive dust in a timely manner to protect the public. The public must be made aware of potentially adverse conditions and the potential impacts to the community.

6.1 Communication

The North Denver Cornerstone Collaborative maintains information on the Project, which is available to the public via the Project website or through the Project hotline.

6.1.1 Project Hotline

Callers with complaints, concerns, or questions should first call Denver's 311 call center, which will direct the call appropriately. The call may be directed to the CCD Project Manager for general information or to the DDPHE complaint system..

Alternatively, callers may contact the North Denver Cornerstone Collaborative Hotline at 303-265-0211.

6.1.2 In-Person Complaints

Any complaints, concerns, or questions presented to the Project team in-person will be forwarded to the MMP Supervisor and CCD Project Manager. The MMP Supervisor and CCD Project Manager will pass along complaints to DDPHE when necessary.

6.2 Reporting

Copies of reports, inspections, routine logs, and other actions in the Project area must be kept on-site and be reasonably accessible. Relevant Project personnel (MMP Supervisor, monitoring personnel) should review the reports, inspections, and logs to evaluate and track existing odors and their impacts on operations.

Appendix C Environmental Protection Agency Regional Screening Levels – Composite Worker and Residential; EPA Toxicity Maximum Concentrations of Contaminants; CDPHE-Hazardous Materials and Waste Management Division Groundwater Protection Values Soil Cleanup Table

Toxicity Characteristic - Maximum Concentration of Contaminants
(Determine Levels using TCLP, Test Method 1311, EPA SW-846)
40CFR 261.24

USEPA Hazardous Waste Number	Constituent	CAS Number	Regulatory Level (mg/l)
D004	**Arsenic**	7440-38-2	**5.0**
D005	**Barium**	7440-39-3	**100.0**
D018 vol	Benzene	71-43-2	0.5
D006	**Cadmium**	7440-43-9	**1.0**
D019 vol	Carbon Tetrachloride	56-23-5	0.5
D020 pest	Chlordane	57-74-9	0.03
D021 vol	Chlorobenzene	108-90-7	100.0
D022 vol	Chloroform	67-66-3	6.0
D007	**Chromium**	7440-47-3	**5.0**
D023 semivol	o-Cresol	95-48-7	200.0*
D024 semivol	m-Cresol	108-39-4	200.0*
D025 semivol	p-Cresol	106-44-5	200.0*
D026 semivol	Cresol	- - -- - - - -	200.0*
D016 herbicide	2,4-D	94-75-7	10.0
D027 vol	1,4-Dichlorobenzene	106-46-7	7.5
D028 vol	1,2-Dichloroethane	107-06-2	0.5
D029 vol	1,1-Dichloroethylene	75-35-4	0.7
D030 semivol	2,4-Dinitrotoluene	121-14-2	0.13
D012 pest	Endrin	72-20-8	0.02
D031 pest	Heptachlor, and its epoxide	76-44-8	0.008
D032 semivol	Hexachlorobenzene	118-74-1	0.13
D033 semivol	Hexachloro-1,3-butadiene	87-68-3	0.5
D034 semivol	Hexachloroethane	67-72-1	3.0
D008	**Lead**	7439-92-1	**5.0**
D013 pest	Lindane	58-89-9	0.4
D009	**Mercury**	7439-97-6	**0.2**
D014 pest	Methoxychlor	72-43-5	10.0
D035 vol	Methyl Ethyl Ketone (MEK) (2-Butanone)	78-93-3	200.0
D036 semivol	Nitrobenzene	98-95-3	2.0
D037 semivol	Pentachlorophenol	87-86-5	100.0
D038 semivol	Pyridine	110-86-1	5.0
D010	**Selenium**	7782-49-2	**1.0**
D011	**Silver**	7440-22-4	**5.0**
D039 vol	Tetrachloroethylene	127-18-4	0.7
D015 pest	Toxaphene	8001-35-2	0.5
D040 vol	Trichloroethylene	79-01-6	0.5
D041 semivol	2,4,5-Trichlorophenol	95-95-4	400.
D042 semivol	2,4,6-Trichlorophenol	88-06-2	2.0
D017 herbicide	2,4,5-TP (Silvex)	93-72-1	1.0
D043 vol	Vinyl Chloride	75-01-4	0.2

* If the o-, m-, and /or p-Cresol concentrations cannot be differentiated, then the total cresol (D026) concentration (200 ppm) is used.
Compounds presented in **blue** are the RCRA eight priority metals
Vol – Volatile organic compound
Semivol – Semi volatile organic compound
Pest - Pesticide

Colorado Department of Public Health and Environment (CDPHE)
Hazardous Materials and Waste Management Division

Groundwater Protection Values Soil Cleanup Table

Class	Analyte (CDPHE Preferred Name)	CAS No.	Groundwater Protection Level		Leachate Reference Concentration		Water Standard	
			[mg/kg]	Notes	[mg/L]	Notes	[mg/L]	Notes
Inorganics	Aluminum	7429-90-5	NA		110		5	1,3
	Antimony	7440-36-0	NA		0.13		0.006	1
	Arsenic	7440-38-2	NA		0.22		0.01	1
	Barium	7440-39-3	NA		44		2	1
	Beryllium	7440-41-7	NA		0.088		0.004	1
	Cadmium and compounds	7440-43-9	NA		0.11		0.005	1
	Chromium(III)	16065-83-1	NA		2.2	6	0.1	1,6
	Chromium(VI) particulates	18540-29-9	NA		0.015		0.0007	2
	Cobalt	7440-48-4	NA		1.1		0.05	1,3
	Copper and compounds	7440-50-8	NA		4.4		0.2	1,3
	Iron	7439-89-6	NA		6.6		0.3	1
	Lead (inorganic)	7439-92-1	NA		1.1		0.05	1
	Lead (tetraethyl)	78-00-2	NA		0.000015		7E-07	2
	Manganese	7439-96-5	NA		1.1		0.05	1
	Mercury (elemental)	7439-97-6	NA		0.025		0.0011	2
	Mercury compounds (i.e., HgCl)	7487-94-7	NA		0.044		0.002	1
	Nickel (soluble salts)	7440-02-0	NA		2.2		0.1	1
	Selenium	7782-49-2	NA		0.44		0.02	1,3
	Silver	7440-22-4	NA		1.1		0.05	1
	Thallium (sulfate etc.)	7440-28-0	NA		0.044		0.002	1
	Vanadium	7440-62-2	NA		2.2		0.1	1,3
	Zinc	7440-66-6	NA		44		2	1,3
	1,1,1,2-Tetrachloroethane	630-20-6	0.16		NA		0.013	2
	1,1,1-Trichloroethane	71-55-6	62		NA		0.2	1,4
			1,000	5	NA		14	1,4
	1,1,2,2-Tetrachloroethane	79-34-5	0.0024		NA		0.00018	1
	1,1,2-Trichloroethane	79-00-5	0.038		NA		0.0028	1
	1,1-Dichloroethane	75-34-3	1.8		NA		0.061	2
	1,1-Dichloroethylene	75-35-4	12		NA		0.007	1
	1,2,3-Trichloropropane	96-18-4	4.80E-04		NA		3.70E-07	1
	1,2,4-Trichlorobenzene	120-82-1	13		NA		0.07	1
	1,2-Dibromo-3-chloropropane	96-12-8	0.002		NA		0.0002	1
	1,2-Dibromoethane	106-93-4	0.00018		NA		0.00002	1
	1,2-Dichlorobenzene	95-50-1	57		NA		0.6	1
	1,2-Dichloroethane	107-06-2	0.0036		NA		0.00038	1
	1,2-Dichloropropane	78-87-5	0.0087		NA		0.00052	1
	1,3,5-Trimethylbenzene	108-67-8	23		NA		0.07	2
	1,3-Dichlorobenzene	541-73-1	8.5		NA		0.094	1
	1,3-Dichloropropene	542-75-6	0.084		NA		0.0035	2
	1,4-Dichlorobenzene	106-46-7	7.8		NA		0.075	1
	1-Methylnaphthalene	90-12-0	0.81		NA		0.012	2
	2-Butanone	78-93-3	18		NA		4.2	2
	2-Chlorophenol	95-57-8	1.2		NA		0.035	1
	2-Hexanone	591-78-6	0.21		NA		0.035	1
	2-Methylnaphthalene	91-57-6	7.4		NA		0.028	2
	4-Methyl-2-pentanone	108-10-1	3.3		NA		0.56	2
	Acenaphthene	83-32-9	1000	5	NA		0.42	1
	Acetone	67-64-1	32		NA		6.3	1
	Acetophenone	98-86-2	5.2		NA		0.7	2
	Anthracene	120-12-7	1000	5	NA		2.1	1
	Benzene	71-43-2	0.17		NA		0.005	1

Class	Analyte (CDPHE Preferred Name)	CAS No.	Groundwater Protection Level		Leachate Reference Concentration		Water Standard	
			[mg/kg]	Notes	[mg/L]	Notes	[mg/L]	Notes
VOCs	beta-Chloronaphthalene	91-58-7	1000	5	NA		0.56	1
	Bis(2-chloroisopropyl)ether	108-60-1	0.037		NA		0.005	2
	Bromobenzene	108-86-1	3		NA		0.056	2
	Bromodichloromethane	75-27-4	0.007		NA		0.00056	1
	Bromomethane	74-83-9	0.16		NA		0.01	2
	Carbon disulfide	75-15-0	1000	5	NA		0.7	2
	Carbon tetrachloride	56-23-5	1.704		NA		0.0005	1
	Chlorobenzene	108-90-7	5.3		NA		0.1	1
	Chloroform	67-66-3	0.085		NA		0.0035	1
	cis-1,2-Dichloroethene	156-59-2	0.261		NA		0.014	1
	Cumene	98-82-8	700		NA		0.7	2
	Dibenzofuran	132-64-9	4.1		NA		0.007	2
	Dibromochloromethane	124-48-1	0.11		NA		0.014	1
	Dichlorodifluoromethane	75-71-8	390		NA		1.4	2
	Ethyl ether	60-29-7	11		NA		1.4	2
	Ethyl methacrylate	97-63-2	1000	5	NA		0.63	2
	Ethylacetate	141-78-6	35		NA		6.3	2
	Ethylbenzene	100-41-4	100		NA		0.7	1
	Fluorene	86-73-7	1000	5	NA		0.28	1
	Hexane	110-54-3	100		NA		0.42	2
	Methylene chloride	75-09-2	0.06		NA		0.005	1
	Naphthalene	91-20-3	23		NA		0.14	1
	Nitrobenzene	98-95-3	0.239		NA		0.014	1
	n-Propylbenzene	103-65-1	77		NA		0.7	2
	Styrene	100-42-5	14		NA		0.1	1
	Tetrachloroethylene	127-18-4	1.9		NA		0.005	1,4
			6.35		NA		0.017	1,4
	Toluene	108-88-3	50		NA		0.56	1
	Total 1,2-dichloroethene	540-59-0	1.9		NA		0.063	2
	Xylenes (total)	1330-20-7	75		NA		1.4	1
	trans-1,2-Dichloroethene	156-60-5	5.4		NA		0.1	1
	Trichloroethylene	79-01-6	0.68		NA		0.005	1
	Trichlorofluoromethane	75-69-4	1000	5	NA		2.1	2
	Trichlorotrifluoroethane	76-13-1	1000	5	NA		210	2
	Vinyl acetate	108-05-4	51		NA		7	2
	Vinyl chloride	75-01-4	0.11		NA		0.000023	1
SVOCs	1,2-Dinitrobenzene	528-29-0	0.014		NA		0.0007	2
	1,4-Dinitrobenzene	100-25-4	0.005		NA		0.0007	2
	1,4-Dioxane	123-91-1	0.0016		NA		3.50E-04	1
	2,4,5-Trichlorophenol	95-95-4	88		NA		0.7	1
	2,4,6-Trichlorophenol	88-06-2	0.28		NA		0.0032	1
	2,4-Dichlorophenol	120-83-2	0.33		NA		0.021	1
	2,4-Dimethylphenol	105-67-9	2.7		NA		0.14	1
	2,4-Dinitrophenol	51-28-5	0.4		NA		0.014	1
	2-Methylphenol	95-48-7	1.2		NA		0.35	2
	3,3'-Dichlorobenzidine	91-94-1	0.041		NA		0.000078	1
	3-Methylphenol	108-39-4	1.2		NA		0.35	2
	4-Methylphenol	106-44-5	0.27		NA		0.035	2
	4-Nitrophenol	100-02-7	2.1		NA		0.056	1
	Benz[a]anthracene	56-55-3	1000	5	NA		4.8E-06	1
	Benzo[a]pyrene	50-32-8	1000	5	NA		4.8E-06	1
	Benzo[b]fluoranthene	205-99-2	1000	5	NA		4.8E-06	1
	Benzo[k]fluoranthene	207-08-9	1000	5	NA		4.8E-06	1
	Benzoic acid at pH 6.8	65-85-0	110		NA		28	2
	Benzyl alcohol	100-51-6	3.9		NA		0.7	2
	Bis-2-ethylhexyl phthalate	117-81-7	1000	5	NA		0.0025	1
	Bromoform	75-25-2	0.048		NA		0.004	1
	Butylbenzylphthalate	85-68-7	1000	5	NA		1.4	1
	Chlordane	57-74-9	1000	5	NA		0.0001	1
	Chrysene	218-01-9	1000	5	NA		4.8E-06	1

Class	Analyte (CDPHE Preferred Name)	CAS No.	Groundwater Protection Level		Leachate Reference Concentration		Water Standard	
			[mg/kg]	Notes	[mg/L]	Notes	[mg/L]	Notes
	Cyclohexanone	108-94-1	200		NA		35	2
	Dibenzo[a,h]anthracene	53-70-3	1000	5	NA		4.8E-06	1
	Diethylphthalate	84-66-2	140		NA		5.6	1
	di-n-Butyl phthalate	84-74-2	1000	5	NA		0.7	1
	diphenylamine	122-39-4	32		NA		0.18	2
	Ethylene glycol	107-21-1	70		NA		14	2
	Fluoranthene	206-44-0	1000	5	NA		0.28	1
	Hexachlorobenzene	118-74-1	0.009		NA		0.000022	1
	Hexachlorobutadiene	87-68-3	0.17		NA		0.00045	1
	Hexachlorocyclopentadiene	77-47-4	1000	5	NA		0.042	1
	Hexachloroethane	67-72-1	0.019		NA		8.80E-04	1
	Indeno[1,2,3-cd]pyrene	193-39-5	1000	5	NA		4.8E-06	1
	N-nitrosodimethylamine	62-75-9	0.000005		NA		6.9E-07	1
	N-Nitrosodinpropylamine	621-64-7	2.8E-07		NA		0.000005	1
	N-Nitrosodiphenylamine	86-30-6	0.67		NA		0.0071	1
	Pentachlorophenol	87-86-5	0.021		NA		8.80E-05	1
	Phenol	108-95-2	47		NA		2.1	1
	Pyrene	129-00-0	1000	5	NA		0.21	1
	Pyridine	110-86-1	0.38		NA		0.007	2
PCBs	Aroclor 1016	12674-11-2	1000	5	NA		0.000017	1
	Aroclor 1254	11097-69-1	1000	5	NA		0.000017	1
	Aroclor 1260	11096-82-5	1000	5	NA		0.000017	1
	PCBs	1336-36-3	1000	5	NA		0.000017	1
Pesticides	2,4,5-T	93-76-5	0.54		NA		0.07	2
	2,4,5-TP	93-72-1	0.48		NA		0.05	1
	2,4-D	94-75-7	2.5		NA		0.07	1
	2,4-DB	94-82-6	2.1		NA		0.056	2
	4,4'-DDD	72-54-8	1000	5	NA		0.00015	1
	4,4'-DDE	72-55-9	1000	5	NA		0.0001	1
	4,4'-DDT	50-29-3	1000	5	NA		0.0001	1
	Aldicarb sulfone	1646-88-4	0.035		NA		0.007	1
	Aldrin	309-00-2	1000	5	NA		2.1E-06	1
	alpha-BHC	319-84-6	0.0017		NA		5.6E-06	1
	beta-BHC	319-85-7	0.046		NA		0.00019	2
	Dalapon	75-99-0	1.1		NA		0.2	1
	Dieldrin	60-57-1	1000	5	NA		0.000002	1
	Dinoseb	88-85-7	0.62		NA		0.007	1
	Endosulfan I	115-29-7	1000	5	NA		0.042	1
	Endosulfan II	33213-65-9	1000	5	NA		0.042	1
	Endosulfan Sulfate	1031-07-8	1000	5	NA		0.042	1
	Endrin	72-20-8	1000	5	NA		0.002	1
	Endrin aldehyde	7421-93-4	4.9		NA		0.0021	1
	gamma-BHC	58-89-9	0.017		NA		0.0002	1
	Heptachlor	76-44-8	1000	5	NA		0.000008	1
	Heptachlor epoxide	1024-57-3	1000	5	NA		0.000004	1
	Isophorone	78-59-1	1.3		NA		0.14	1
	MCPA	94-74-6	0.028		NA		0.0035	2
	MCPP	93-65-2	0.054		NA		0.007	2
	Methoxychlor	72-43-5	1000		NA		0.035	1
	Phorate	298-02-2	0.15		NA		0.0014	2
	Terbufos	13071-79-9	0.031		NA		0.00018	2
	Toxaphene	8001-35-2	1000	5	NA		0.000032	1
Explosives	2,4,6-Trinitrotoluene	118-96-7	1.7		NA		0.012	2
	2,4/2,6-Dinitrotoluene mix	25321-14-6	0.015		NA		0.00051	2
	2,4-Dinitrotoluene	121-14-2	0.0032		NA		0.00011	1
	2,6-Dinitrotoluene	606-20-2	0.2		NA		0.007	2
	2-Amino-4,6-dinitrotoluene	35572-78-2	0.16		NA		0.014	2
	4-Amino-2,6-dinitrotoluene	19406-51-0	0.16		NA		0.014	2
	4-Nitrotoluene	99-99-0	0.59		NA		0.022	2
	Tetryl	479-45-8	0.6		NA		0.028	2

Class	Analyte (CDPHE Preferred Name)	CAS No.	Groundwater Protection Level		Leachate Reference Concentration		Water Standard	
			[mg/kg]	Notes	[mg/L]	Notes	[mg/L]	Notes
Anions	Cyanide (free)	57-12-5	NA		4.4		0.2	1
	Cyanide (hydrogen)	74-90-8	NA		3.1		0.14	2
	Nitrate	14797-55-8	NA		220		10	1
	Nitrite	14797-65-0	NA		22		1	1

NOTES:

1. Water standard based on current state groundwater standard or federal Maximum Concentration Level (MCL).
2. Water standard based on Maximum Concentration Level (MCL)-equivalent calculation.
3. Water standard based on state agricultural standard.
4. When two groundwater protection levels are listed for the same consituent, the division will determine the applicable protection level based upon current and potential future uses of groundwater.
5. Table value is capped at a maximum concentration of 1,000 mg/kg to account for the possibility that at high concentrations free phase material may be present and to protect against acute health impacts.
6. Based on total chromium.

NA - Not applicable.

VOCs - Volatile organic carbons

SVOCs - Semi-volatile organic carbons

PCBs - Polychlorinated biphenyls

Key: I = IRIS; P = PPRTV; D = DWSHA; O = OPP; A = ATSDR; C = Cal EPA; X = APPENDIX PPRTV SCREEN (See FAQ #29); H = HEAST; F = See FAQ; E = see user guide Section 2.3.5; W = see user guide Section 2.3.6; L = see user guide on lead; M = mutagen; S = see user guide Section 5; V = volatile; R = RBA applied (See User Guide for Arsenic notice) ; c = cancer; n = noncancer; * = where: n SL < 100X c SL; ** = where n SL < 10X c SL; SSL values are based on DAF=1; m = Concentration may exceed ceiling limit (See User Guide); s = Concentration may exceed Csat (See User Guide)

Toxicity and Chemical-specific Information														Contaminant		Carcinogenic Target Risk (TR) = 1E-06				Noncancer Child Hazard Index (HI) = 1			
SFO (mg/kg-day)$^{-1}$	key	IUR (ug/m^3)$^{-1}$	key	RfD_o (mg/kg-day)	key	RfC_i (mg/m^3)	key	vol	muta-gen	C_{sat} (mg/kg)	PEF (m^3/kg)	VF (m^3/kg)	GIABS	ABS	Analyte	CAS No.	Ingestion SL TR=1E-06 (mg/kg)	Dermal SL TR=1E-06 (mg/kg)	Inhalation SL TR=1E-06 (mg/kg)	Carcinogenic SL TR=1E-06 (mg/kg)	Ingestion SL Child THQ=1 (mg/kg)	Dermal SL Child THQ=1 (mg/kg)	Inhalation SL Child THQ=1 (mg/kg)	Noncarcinogenic SL Child THI=1 (mg/kg)
				1.2E-03	O						1.4E+09		1	0.1	Acephate	30560-19-1					9.4E+01	4.0E+02		7.6E+01
		2.2E-06	I			9.0E-03	I	V		1.1E+05	1.4E+09	8.7E+03	1		Acetaldehyde	75-07-0			1.1E+01	1.1E+01			8.2E+01	8.2E+01
				2.0E-02	I						1.4E+09		1	0.1	Acetochlor	34256-82-1					1.6E+03	6.6E+03		1.3E+03
				9.0E-01	I	3.1E+01	A	V		1.1E+05	1.4E+09	1.4E+04	1		Acetone	67-64-1					7.0E+04		4.4E+05	6.1E+04
						2.0E-03	X				1.4E+09		1	0.1	Acetone Cyanohydrin	75-86-5							2.8E+06	2.8E+06
						6.0E-02	I	V		1.3E+05	1.4E+09	1.3E+04	1		Acetonitrile	75-05-8							8.1E+02	8.1E+02
				1.0E-01	I			V		2.5E+03	1.4E+09	6.0E+04	1		Acetophenone	98-86-2					7.8E+03			7.8E+03
3.8E+00	C	1.3E-03	C								1.4E+09		1	0.1	Acetylaminofluorene, 2-	53-96-3	1.8E-01	6.5E-01	2.9E+03	1.4E-01				
				5.0E-04	I	2.0E-05	I	V		2.3E+04	1.4E+09	6.9E+03	1		Acrolein	107-02-8					3.9E+01		1.4E-01	1.4E-01
5.0E-01	I	1.0E-04	I	2.0E-03	I	6.0E-03	I		M		1.4E+09		1	0.1	Acrylamide	79-06-1	3.1E-01	1.2E+00	1.4E+04	2.4E-01	1.6E+02	6.6E+02	8.5E+06	1.3E+02
				5.0E-01	I	1.0E-03	I	V		1.1E+05	1.4E+09	9.5E+04	1		Acrylic Acid	79-10-7					3.9E+04		9.9E+01	9.9E+01
5.4E-01	I	6.8E-05	I	4.0E-02	A	2.0E-03	I	V		1.1E+04	1.4E+09	7.7E+03	1		Acrylonitrile	107-13-1	1.3E+00		3.2E-01	2.5E-01	3.1E+03		1.6E+01	1.6E+01
						6.0E-03	P				1.4E+09		1	0.1	Adiponitrile	111-69-3							8.5E+06	8.5E+06
5.6E-02	C			1.0E-02	I						1.4E+09		1	0.1	Alachlor	15972-60-8	1.2E+01	4.4E+01		9.7E+00	7.8E+02	3.3E+03		6.3E+02
				1.0E-03	I						1.4E+09		1	0.1	Aldicarb	116-06-3					7.8E+01	3.3E+02		6.3E+01
				1.0E-03	I						1.4E+09		1	0.1	Aldicarb Sulfone	1646-88-4					7.8E+01	3.3E+02		6.3E+01
											1.4E+09		1	0.1	Aldicarb sulfoxide	1646-87-3								
1.7E+01	I	4.9E-03	I	3.0E-05	I			V			1.4E+09	1.7E+06	1		Aldrin	309-00-2	4.1E-02		9.8E-01	3.9E-02	2.3E+00			2.3E+00
				5.0E-03	I	1.0E-04	X	V		1.1E+05	1.4E+09	3.4E+04	1		Allyl Alcohol	107-18-6					3.9E+02		3.6E+00	3.5E+00
2.1E-02	C	6.0E-06	C			1.0E-03	I	V		1.4E+03	1.4E+09	1.6E+03	1		Allyl Chloride	107-05-1	3.3E+01		7.4E-01	7.2E-01			1.7E+00	1.7E+00
				1.0E+00	P	5.0E-03	P				1.4E+09		1		Aluminum	7429-90-5					7.8E+04		7.1E+06	7.7E+04
				4.0E-04	I						1.4E+09		1		Aluminum Phosphide	20859-73-8					3.1E+01			3.1E+01
				9.0E-03	I						1.4E+09		1	0.1	Ametryn	834-12-8					7.0E+02	3.0E+03		5.7E+02
2.1E+01	C	6.0E-03	C								1.4E+09		1	0.1	Aminobiphenyl, 4-	92-67-1	3.3E-02	1.2E-01	6.4E+02	2.6E-02				
				8.0E-02	P						1.4E+09		1	0.1	Aminophenol, m-	591-27-5					6.3E+03	2.6E+04		5.1E+03
				4.0E-03	X						1.4E+09		1	0.1	Aminophenol, o-	95-55-6					3.1E+02	1.3E+03		2.5E+02
				2.0E-02	P						1.4E+09		1	0.1	Aminophenol, p-	123-30-8					1.6E+03	6.6E+03		1.3E+03
				2.5E-03	I						1.4E+09		1	0.1	Amitraz	33089-61-1					2.0E+02	8.2E+02		1.6E+02
						5.0E-01	I	V					1		Ammonia	7664-41-7								
				2.0E-01	I						1.4E+09		1		Ammonium Sulfamate	7773-06-0					1.6E+04			1.6E+04
						3.0E-03	X	V		1.4E+04	1.4E+09	2.6E+04	1		Amyl Alcohol, tert-	75-85-4							8.2E+01	8.2E+01
5.7E-03	I	1.6E-06	C	7.0E-03	P	1.0E-03	I				1.4E+09		1	0.1	Aniline	62-53-3	1.2E+02	4.3E+02	2.4E+06	9.5E+01	5.5E+02	2.3E+03	1.4E+06	4.4E+02
4.0E-02	P			2.0E-03	X						1.4E+09		1	0.1	Anthraquinone, 9,10-	84-65-1	1.7E+01	6.2E+01		1.4E+01	1.6E+02	6.6E+02		1.3E+02
				4.0E-04	I						1.4E+09		0.15		Antimony (metallic)	7440-36-0					3.1E+01			3.1E+01
				5.0E-04	H						1.4E+09		0.15		Antimony Pentoxide	1314-60-9					3.9E+01			3.9E+01
				4.0E-04	H						1.4E+09		0.15		Antimony Tetroxide	1332-81-6					3.1E+01			3.1E+01
						2.0E-04	I				1.4E+09		0.15		Antimony Trioxide	1309-64-4							2.8E+05	2.8E+05
1.5E+00	I	4.3E-03	I	3.0E-04	I	1.5E-05	C				1.4E+09		1	0.03	Arsenic, Inorganic	7440-38-2	7.7E-01	5.5E+00	8.9E+02	6.8E-01	3.9E+01	3.3E+02	2.1E+04	3.5E+01
				3.5E-06	C	5.0E-05	I				1.4E+09		1		Arsine	7784-42-1					2.7E-01		7.1E+04	2.7E-01
				3.6E-02	O						1.4E+09		1	0.1	Asulam	3337-71-1					2.8E+03	1.2E+04		2.3E+03
2.3E-01	C			3.5E-02	I						1.4E+09		1	0.1	Atrazine	1912-24-9	3.0E+00	1.1E+01		2.4E+00	2.7E+03	1.2E+04		2.2E+03
8.8E-01	C	2.5E-04	C								1.4E+09		1	0.1	Auramine	492-80-8	7.9E-01	2.8E+00	1.5E+04	6.2E-01				
				4.0E-04	I						1.4E+09		1	0.1	Avermectin B1	65195-55-3					3.1E+01	1.3E+02		2.5E+01
				3.0E-03	A	1.0E-02	A				1.4E+09		1	0.1	Azinphos-methyl	86-50-0					2.3E+02	9.9E+02	1.4E+07	1.9E+02
1.1E-01	I	3.1E-05	I					V			1.4E+09	5.2E+05	1		Azobenzene	103-33-3	6.3E+00		4.7E+01	5.6E+00				
				1.0E+00	P	7.0E-06	P				1.4E+09		1	0.1	Azodicarbonamide	123-77-3					7.8E+04	3.3E+05	9.9E+03	8.6E+03
				2.0E-01	I	5.0E-04	H				1.4E+09		0.07		Barium	7440-39-3					1.6E+04		7.1E+05	1.5E+04
				5.0E-03	O			V			1.4E+09	3.1E+05	1		Benfluralin	1861-40-1					3.9E+02			3.9E+02
				5.0E-02	I						1.4E+09		1	0.1	Benomyl	17804-35-2					3.9E+03	1.6E+04		3.2E+03
				2.0E-01	I						1.4E+09		1	0.1	Bensulfuron-methyl	83055-99-6					1.6E+04	6.6E+04		1.3E+04
				3.0E-02	I						1.4E+09		1	0.1	Bentazon	25057-89-0					2.3E+03	9.9E+03		1.9E+03
4.0E-03	P			1.0E-01	I			V		1.2E+03	1.4E+09	2.2E+04	1		Benzaldehyde	100-52-7	1.7E+02			1.7E+02	7.8E+03			7.8E+03
5.5E-02	I	7.8E-06	I	4.0E-03	I	3.0E-02	I	V		1.8E+03	1.4E+09	3.5E+03	1		Benzene	71-43-2	1.3E+01		1.3E+00	1.2E+00	3.1E+02		1.1E+02	8.2E+01
1.0E-01	X			3.0E-04	X						1.4E+09		1	0.1	Benzenediamine-2-methyl sulfate, 1,4-	6369-59-1	7.0E+00	2.5E+01		5.4E+00	2.3E+01	9.9E+01		1.9E+01
				1.0E-03	P			V		1.3E+03	1.4E+09	1.9E+04	1		Benzenethiol	108-98-5					7.8E+01			7.8E+01
2.3E+02	I	6.7E-02	I	3.0E-03	I				M		1.4E+09		1	0.1	Benzidine	92-87-5	6.7E-04	2.6E-03	2.1E+01	5.3E-04	2.3E+02	9.9E+02		1.9E+02
				4.0E+00	I						1.4E+09		1	0.1	Benzoic Acid	65-85-0					3.1E+05	1.3E+06		2.5E+05
1.3E+01	I							V		3.2E+02	1.4E+09	6.8E+04	1		Benzotrichloride	98-07-7	5.3E-02			5.3E-02				
				1.0E-01	P						1.4E+09		1	0.1	Benzyl Alcohol	100-51-6					7.8E+03	3.3E+04		6.3E+03
1.7E-01	I	4.9E-05	C	2.0E-03	P	1.0E-03	P	V		1.5E+03	1.4E+09	2.5E+04	1		Benzyl Chloride	100-44-7	4.1E+00		1.5E+00	1.1E+00	1.6E+02		2.7E+01	2.3E+01
		2.4E-03	I	2.0E-03	I	2.0E-05	I				1.4E+09		0.007		Beryllium and compounds	7440-41-7			1.6E+03	1.6E+03	1.6E+02		2.8E+04	1.6E+02
				9.0E-03	P						1.4E+09		1	0.1	Bifenox	42576-02-3					7.0E+02	3.0E+03		5.7E+02
				1.5E-02	I						1.4E+09		1	0.1	Biphenthrin	82657-04-3					1.2E+03	4.9E+03		9.5E+02
8.0E-03	I			5.0E-01	I	4.0E-04	X	V			1.4E+09	1.1E+05	1		Biphenyl, 1,1'-	92-52-4	8.7E+01			8.7E+01	3.9E+04		4.8E+01	4.7E+01
				4.0E-02	I			V		1.0E+03	1.4E+09	3.5E+04	1		Bis(2-chloro-1-methylethyl) ether	108-60-1					3.1E+03			3.1E+03
				3.0E-03	P						1.4E+09		1	0.1	Bis(2-chloroethoxy)methane	111-91-1					2.3E+02	9.9E+02		1.9E+02
1.1E+00	I	3.3E-04	I					V		5.1E+03	1.4E+09	4.3E+04	1		Bis(2-chloroethyl)ether	111-44-4	6.3E-01		3.6E-01	2.3E-01				
2.2E+02	I	6.2E-02	I					V		4.2E+03	1.4E+09	1.9E+03	1		Bis(chloromethyl)ether	542-88-1	3.2E-03		8.5E-05	8.3E-05				
				5.0E-02	I						1.4E+09		1	0.1	Bisphenol A	80-05-7					3.9E+03	1.6E+04		3.2E+03

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Toxicity and Chemical-specific Information														Contaminant		Carcinogenic Target Risk (TR) = 1E-06				Noncancer Child Hazard Index (HI) = 1			
SFO (mg/kg-day)$^{-1}$	key	IUR (ug/m^3)$^{-1}$	key	RfD_o (mg/kg-day)	key	RfC_i (mg/m^3)	key	vol	muta-gen	C_{sat} (mg/kg)	PEF (m^3/kg)	VF (m^3/kg)	GIABS	ABS	Analyte	CAS No.	Ingestion SL TR=1E-06 (mg/kg)	Dermal SL TR=1E-06 (mg/kg)	Inhalation SL TR=1E-06 (mg/kg)	Carcinogenic SL TR=1E-06 (mg/kg)	Ingestion SL Child THQ=1 (mg/kg)	Dermal SL Child THQ=1 (mg/kg)	Inhalation SL Child THQ=1 (mg/kg)	Noncarcinogenic SL Child THI=1 (mg/kg)
				2.0E-01	I	2.0E-02	H				1.4E+09		1		Boron And Borates Only	7440-42-8					1.6E+04		2.8E+07	1.6E+04
				2.0E+00	P	2.0E-02	P	V			1.4E+09		1		Boron Trichloride	10294-34-5					1.6E+05		2.8E+07	1.6E+05
				4.0E-02	C	1.3E-02	C	V			1.4E+09		1		Boron Trifluoride	7637-07-2					3.1E+03		1.8E+07	3.1E+03
7.0E-01	I			4.0E-03	I						1.4E+09		1		Bromate	15541-45-4	9.9E-01			9.9E-01	3.1E+02			3.1E+02
2.0E+00	X	6.0E-04	X					V		2.4E+03	1.4E+09	5.9E+03	1		Bromo-2-chloroethane, 1-	107-04-0	3.5E-01		2.8E-02	2.6E-02				
				3.0E-04	X			V		9.0E+02	1.4E+09	1.1E+04	1		Bromo-3-fluorobenzene, 1-	1073-06-9					2.3E+01			2.3E+01
				3.0E-04	X			V		3.2E+02	1.4E+09	1.1E+04	1		Bromo-4-fluorobenzene, 1-	460-00-4					2.3E+01			2.3E+01
				8.0E-03	I	6.0E-02	I	V		6.8E+02	1.4E+09	8.4E+03	1		Bromobenzene	108-86-1					6.3E+02		5.2E+02	2.9E+02
						4.0E-02	X	V		4.0E+03	1.4E+09	3.6E+03	1		Bromochloromethane	74-97-5							1.5E+02	1.5E+02
6.2E-02	I	3.7E-05	C	2.0E-02	I			V		9.3E+02	1.4E+09	4.0E+03	1		Bromodichloromethane	75-27-4	1.1E+01		3.0E-01	2.9E-01	1.6E+03			1.6E+03
7.9E-03	I	1.1E-06	I	2.0E-02	I			V		9.2E+02	1.4E+09	9.7E+03	1		Bromoform	75-25-2	8.8E+01		2.5E+01	1.9E+01	1.6E+03			1.6E+03
				1.4E-03	I	5.0E-03	I	V		3.6E+03	1.4E+09	1.4E+03	1		Bromomethane	74-83-9					1.1E+02		7.3E+00	6.8E+00
				5.0E-03	H			V			1.4E+09	1.2E+05	1		Bromophos	2104-96-3					3.9E+02			3.9E+02
						1.0E-01	A	V		9.7E+02	1.4E+09	2.1E+03	1		Bromopropane, 1-	106-94-5							2.2E+02	2.2E+02
1.0E-01	O			1.5E-02	O						1.4E+09		1	0.1	Bromoxynil	1689-84-5	6.7E+00	2.4E+01		5.3E+00	1.2E+03	4.9E+03		9.5E+02
				1.5E-02	O			V			1.4E+09	4.7E+05	1		Bromoxynil Octanoate	1689-99-2					1.2E+03			1.2E+03
3.4E+00	C	3.0E-05	I			2.0E-03	I	V		6.7E+02	1.4E+09	8.7E+02	1		Butadiene, 1,3-	106-99-0	2.0E-01		8.1E-02	5.8E-02			1.8E+00	1.8E+00
				3.0E-02	O						1.4E+09		1	0.1	Butanoic acid, 4-(2,4-dichlorophenoxy)-	94-82-6					2.3E+03	9.9E+03		1.9E+03
				1.0E-01	I			V		7.6E+03	1.4E+09	3.0E+04	1		Butanol, N-	71-36-3					7.8E+03			7.8E+03
				2.0E+00	P	3.0E+01	P	V		2.1E+04	1.4E+09	2.9E+04	1		Butyl alcohol, sec-	78-92-2					1.6E+05		9.1E+05	1.3E+05
				5.0E-02	I			V			1.4E+09	8.6E+04	1		Butylate	2008-41-5					3.9E+03			3.9E+03
2.0E-04	C	5.7E-08	C								1.4E+09		1	0.1	Butylated hydroxyanisole	25013-16-5	3.5E+03	1.2E+04	6.7E+07	2.7E+03				
3.6E-03	P			3.0E-01	P						1.4E+09		1	0.1	Butylated hydroxytoluene	128-37-0	1.9E+02	6.9E+02		1.5E+02	2.3E+04	9.9E+04		1.9E+04
				5.0E-02	P			V		1.1E+02	1.4E+09	8.1E+03	1		Butylbenzene, n-	104-51-8					3.9E+03			3.9E+03
				1.0E-01	X			V		1.5E+02	1.4E+09	7.4E+03	1		Butylbenzene, sec-	135-98-8					7.8E+03			7.8E+03
				1.0E-01	X			V		1.8E+02	1.4E+09	7.4E+03	1		Butylbenzene, tert-	98-06-6					7.8E+03			7.8E+03
				2.0E-02	A						1.4E+09		1	0.1	Cacodylic Acid	75-60-5					1.6E+03	6.6E+03		1.3E+03
		1.8E-03	I	1.0E-03	I	1.0E-05	A				1.4E+09		0.025	0.001	Cadmium (Diet)	7440-43-9			2.1E+03	2.1E+03	7.8E+01	8.2E+02	1.4E+04	7.1E+01
		1.8E-03	I	5.0E-04	I	1.0E-05	A						0.05	0.001	Cadmium (Water)	7440-43-9								
				5.0E-01	I	2.2E-03	C				1.4E+09		1	0.1	Caprolactam	105-60-2					3.9E+04	1.6E+05	3.1E+06	3.1E+04
1.5E-01	C	4.3E-05	C	2.0E-03	I						1.4E+09		1	0.1	Captafol	2425-06-1	4.6E+00	1.6E+01	8.9E+04	3.6E+00	1.6E+02	6.6E+02		1.3E+02
2.3E-03	C	6.6E-07	C	1.3E-01	I						1.4E+09		1	0.1	Captan	133-06-2	3.0E+02	1.1E+03	5.8E+06	2.4E+02	1.0E+04	4.3E+04		8.2E+03
				1.0E-01	I						1.4E+09		1	0.1	Carbaryl	63-25-2					7.8E+03	3.3E+04		6.3E+03
				5.0E-03	I						1.4E+09		1	0.1	Carbofuran	1563-66-2					3.9E+02	1.6E+03		3.2E+02
				1.0E-01	I	7.0E-01	I	V		7.4E+02	1.4E+09	1.2E+03	1		Carbon Disulfide	75-15-0					7.8E+03		8.5E+02	7.7E+02
7.0E-02	I	6.0E-06	I	4.0E-03	I	1.0E-01	I	V		4.6E+02	1.4E+09	1.5E+03	1		Carbon Tetrachloride	56-23-5	9.9E+00		7.0E-01	6.5E-01	3.1E+02		1.6E+02	1.0E+02
						1.0E-01	P	V		5.9E+03	1.4E+09	6.5E+02	1		Carbonyl Sulfide	463-58-1							6.7E+01	6.7E+01
				1.0E-02	I						1.4E+09		1	0.1	Carbosulfan	55285-14-8					7.8E+02	3.3E+03		6.3E+02
				1.0E-01	I						1.4E+09		1	0.1	Carboxin	5234-68-4					7.8E+03	3.3E+04		6.3E+03
						9.0E-04	I				1.4E+09		1		Ceric oxide	1306-38-3							1.3E+06	1.3E+06
				1.0E-01	I			V			1.4E+09	1.5E+05	1		Chloral Hydrate	302-17-0					7.8E+03			7.8E+03
				1.5E-02	I						1.4E+09		1	0.1	Chloramben	133-90-4					1.2E+03	4.9E+03		9.5E+02
4.0E-01	H										1.4E+09		1	0.1	Chloranil	118-75-2	1.7E+00	6.1E+00		1.3E+00				
3.5E-01	I	1.0E-04	I	5.0E-04	I	7.0E-04	I	V			1.4E+09	1.5E+06	1	0.04	Chlordane	12789-03-6	2.0E+00	1.8E+01	4.3E+01	1.7E+00	3.9E+01	4.1E+02	1.1E+03	3.5E+01
1.0E+01	I	4.6E-03	C	3.0E-04	I						1.4E+09		1	0.1	Chlordecone (Kepone)	143-50-0	7.0E-02	2.5E-01	8.3E+02	5.4E-02	2.3E+01	9.9E+01		1.9E+01
				7.0E-04	A						1.4E+09		1	0.1	Chlorfenvinphos	470-90-6					5.5E+01	2.3E+02		4.4E+01
				9.0E-02	O						1.4E+09		1	0.1	Chlorimuron, Ethyl-	90982-32-4					7.0E+03	3.0E+04		5.7E+03
				1.0E-01	I	1.5E-04	A	V		2.8E+03	1.4E+09	1.2E+03	1		Chlorine	7782-50-5					7.8E+03		1.8E-01	1.8E-01
				3.0E-02	I	2.0E-04	I	V			1.4E+09		1		Chlorine Dioxide	10049-04-4					2.3E+03		2.8E+05	2.3E+03
				3.0E-02	I						1.4E+09		1		Chlorite (Sodium Salt)	7758-19-2					2.3E+03			2.3E+03
						5.0E-01	I	V		1.2E+03	1.4E+09	1.0E+03	1		Chloro-1,1-difluoroethane, 1-	75-68-3							5.4E+04	5.4E+04
		3.0E-04	I	2.0E-02	H	2.0E-02	I	V		7.9E+02	1.4E+09	1.1E+03	1		Chloro-1,3-butadiene, 2-	126-99-8			1.0E-02	1.0E-02	1.6E+03		2.2E+01	2.2E+01
4.6E-01	H										1.4E+09		1	0.1	Chloro-2-methylaniline HCl, 4-	3165-93-3	1.5E+00	5.4E+00		1.2E+00				
1.0E-01	P	7.7E-05	C	3.0E-03	X						1.4E+09		1	0.1	Chloro-2-methylaniline, 4-	95-69-2	7.0E+00	2.5E+01	5.0E+04	5.4E+00	2.3E+02	9.9E+02		1.9E+02
2.7E-01	X							V		1.2E+04	1.4E+09	1.6E+04	1		Chloroacetaldehyde, 2-	107-20-0	2.6E+00			2.6E+00				
											1.4E+09		1	0.1	Chloroacetic Acid	79-11-8								
						3.0E-05	I				1.4E+09		1	0.1	Chloroacetophenone, 2-	532-27-4							4.3E+04	4.3E+04
2.0E-01	P			4.0E-03	I						1.4E+09		1	0.1	Chloroaniline, p-	106-47-8	3.5E+00	1.2E+01		2.7E+00	3.1E+02	1.3E+03		2.5E+02
				2.0E-02	I	5.0E-02	P	V		7.6E+02	1.4E+09	6.4E+03	1		Chlorobenzene	108-90-7					1.6E+03		3.4E+02	2.8E+02
				1.0E-01	X						1.4E+09		1	0.1	Chlorobenzene sulfonic acid, p-	98-66-8					7.8E+03	3.3E+04		6.3E+03
1.1E-01	C	3.1E-05	C	2.0E-02	I						1.4E+09		1	0.1	Chlorobenzilate	510-15-6	6.3E+00	2.2E+01	1.2E+05	4.9E+00	1.6E+03	6.6E+03		1.3E+03
				3.0E-02	X						1.4E+09		1	0.1	Chlorobenzoic Acid, p-	74-11-3					2.3E+03	9.9E+03		1.9E+03
				3.0E-03	P	3.0E-01	P	V		2.9E+02	1.4E+09	6.8E+03	1		Chlorobenzotrifluoride, 4-	98-56-6					2.3E+02		2.1E+03	2.1E+02
				4.0E-02	P			V		7.3E+02	1.4E+09	1.8E+03	1		Chlorobutane, 1-	109-69-3					3.1E+03			3.1E+03
						5.0E+01	I	V		1.7E+03	1.4E+09	9.4E+02	1		Chlorodifluoromethane	75-45-6							4.9E+04	4.9E+04
				2.0E-02	P			V		1.1E+05	1.4E+09	7.8E+04	1		Chloroethanol, 2-	107-07-3					1.6E+03			1.6E+03
3.1E-02	C	2.3E-05	I	1.0E-02	I	9.8E-02	A	V		2.5E+03	1.4E+09	2.6E+03	1		Chloroform	67-66-3	2.2E+01		3.2E-01	3.2E-01	7.8E+02		2.7E+02	2.0E+02
						9.0E-02	I	V		1.3E+03	1.4E+09	1.2E+03	1		Chloromethane	74-87-3							1.1E+02	1.1E+02
2.4E+00	C	6.9E-04	C					V		9.3E+03	1.4E+09	5.3E+03	1		Chloromethyl Methyl Ether	107-30-2	2.9E-01		2.2E-02	2.0E-02				

Key: I = IRIS; P = PPRTV; D = DWSHA; O = OPP; A = ATSDR; C = Cal EPA; X = APPENDIX PPRTV SCREEN (See FAQ #29); H = HEAST; F = See FAQ; E = see user guide Section 2.3.5; W = see user guide Section 2.3.6; L = see user guide on lead; M = mutagen; S = see user guide Section 5; V = volatile; R = RBA applied (See User Guide for Arsenic notice) ; c = cancer; n = noncancer; * = where: n SL < 100X c SL; ** = where n SL < 10X c SL; SSL values are based on DAF=1; m = Concentration may exceed ceiling limit (See User Guide); s = Concentration may exceed Csat (See User Guide)

Toxicity and Chemical-specific Information														Contaminant		Carcinogenic Target Risk (TR) = 1E-06				Noncancer Child Hazard Index (HI) = 1			
SFO (mg/kg-day)$^{-1}$	key	IUR (ug/m^3)$^{-1}$	key	RfD_o (mg/kg-day)	key	RfC_i (mg/m^3)	key	vol	muta-gen	C_{sat} (mg/kg)	PEF (m^3/kg)	VF (m^3/kg)	GIABS	ABS	Analyte	CAS No.	Ingestion SL TR=1E-06 (mg/kg)	Dermal SL TR=1E-06 (mg/kg)	Inhalation SL TR=1E-06 (mg/kg)	Carcinogenic SL TR=1E-06 (mg/kg)	Ingestion SL Child THQ=1 (mg/kg)	Dermal SL Child THQ=1 (mg/kg)	Inhalation SL Child THQ=1 (mg/kg)	Noncarcinogenic SL Child THI=1 (mg/kg)
3.0E-01	P			3.0E-03	P	1.0E-05	X				1.4E+09		1	0.1	Chloronitrobenzene, o-	88-73-3	2.3E+00	8.2E+00		1.8E+00	2.3E+02	9.9E+02	1.4E+04	1.9E+02
6.0E-02	P			7.0E-04	P	2.0E-03	P				1.4E+09		1	0.1	Chloronitrobenzene, p-	100-00-5	1.2E+01	4.1E+01		9.0E+00	5.5E+01	2.3E+02	2.8E+06	4.4E+01
				5.0E-03	I			V		2.7E+04	1.4E+09	1.4E+05	1		Chlorophenol, 2-	95-57-8					3.9E+02			3.9E+02
						4.0E-04	C	V		6.2E+02	1.4E+09	4.7E+03	1		Chloropicrin	76-06-2							2.0E+00	2.0E+00
3.1E-03	C	8.9E-07	C	1.5E-02	I						1.4E+09		1	0.1	Chlorothalonil	1897-45-6	2.2E+02	8.0E+02	4.3E+06	1.8E+02	1.2E+03	4.9E+03		9.5E+02
				2.0E-02	I			V		9.1E+02	1.4E+09	8.1E+03	1		Chlorotoluene, o-	95-49-8					1.6E+03			1.6E+03
				2.0E-02	X			V		2.5E+02	1.4E+09	7.3E+03	1		Chlorotoluene, p-	106-43-4					1.6E+03			1.6E+03
2.4E+02	C	6.9E-02	C								1.4E+09		1	0.1	Chlorozotocin	54749-90-5	2.9E-03	1.0E-02	5.5E+01	2.3E-03				
				5.0E-02	O						1.4E+09		1	0.1	Chlorpropham	101-21-3					3.9E+03	1.6E+04		3.2E+03
				1.0E-03	A						1.4E+09		1	0.1	Chlorpyrifos	2921-88-2					7.8E+01	3.3E+02		6.3E+01
				1.0E-02	H						1.4E+09		1	0.1	Chlorpyrifos Methyl	5598-13-0					7.8E+02	3.3E+03		6.3E+02
				2.0E-02	O						1.4E+09		1	0.1	Chlorsulfuron	64902-72-3					1.6E+03	6.6E+03		1.3E+03
				1.0E-02	I						1.4E+09		1	0.1	Chlorthal-dimethyl	1861-32-1					7.8E+02	3.3E+03		6.3E+02
				8.0E-04	H						1.4E+09		1	0.1	Chlorthiophos	60238-56-4					6.3E+01	2.6E+02		5.1E+01
				1.5E+00	I						1.4E+09		0.013		Chromium(III), Insoluble Salts	16065-83-1					1.2E+05			1.2E+05
5.0E-01	C	8.4E-02	S	3.0E-03	I	1.0E-04	I		M		1.4E+09		0.025		Chromium(VI)	18540-29-9	3.1E-01		1.6E+01	3.0E-01	2.3E+02		1.4E+05	2.3E+02
											1.4E+09		0.013		Chromium, Total	7440-47-3								
				1.3E-02	I						1.4E+09		1	0.1	Clofentezine	74115-24-5					1.0E+03	4.3E+03		8.2E+02
		9.0E-03	P	3.0E-04	P	6.0E-06	P				1.4E+09		1		Cobalt	7440-48-4			4.2E+02	4.2E+02	2.3E+01		8.5E+03	2.3E+01
		6.2E-04	I					V	M				1		Coke Oven Emissions	8007-45-2								
				4.0E-02	H						1.4E+09		1		Copper	7440-50-8					3.1E+03			3.1E+03
				5.0E-02	I	6.0E-01	C				1.4E+09		1	0.1	Cresol, m-	108-39-4					3.9E+03	1.6E+04	8.5E+08	3.2E+03
				5.0E-02	I	6.0E-01	C				1.4E+09		1	0.1	Cresol, o-	95-48-7					3.9E+03	1.6E+04	8.5E+08	3.2E+03
				1.0E-01	A	6.0E-01	C				1.4E+09		1	0.1	Cresol, p-	106-44-5					7.8E+03	3.3E+04	8.5E+08	6.3E+03
				1.0E-01	A						1.4E+09		1	0.1	Cresol, p-chloro-m-	59-50-7					7.8E+03	3.3E+04		6.3E+03
				1.0E-01	A	6.0E-01	C				1.4E+09		1	0.1	Cresols	1319-77-3					7.8E+03	3.3E+04	8.5E+08	6.3E+03
1.9E+00	H			1.0E-03	P			V		1.7E+04	1.4E+09	1.9E+04	1		Crotonaldehyde, trans-	123-73-9	3.7E-01			3.7E-01	7.8E+01			7.8E+01
				1.0E-01	I	4.0E-01	I	V		2.7E+02	1.4E+09	6.2E+03	1		Cumene	98-82-8					7.8E+03		2.6E+03	1.9E+03
2.2E-01	C	6.3E-05	C								1.4E+09		1	0.1	Cupferron	135-20-6	3.2E+00	1.1E+01	6.1E+04	2.5E+00				
8.4E-01	H			2.0E-03	H						1.4E+09		1	0.1	Cyanazine	21725-46-2	8.3E-01	2.9E+00		6.5E-01	1.6E+02	6.6E+02		1.3E+02
															Cyanides									
				1.0E-03	I						1.4E+09		1		~Calcium Cyanide	592-01-8					7.8E+01			7.8E+01
				5.0E-03	I						1.4E+09		1		~Copper Cyanide	544-92-3					3.9E+02			3.9E+02
				6.0E-04	I	8.0E-04	S	V		9.5E+05	1.4E+09	5.3E+04	1		~Cyanide (CN-)	57-12-5					4.7E+01		4.4E+01	2.3E+01
				1.0E-03	I			V			1.4E+09		1		~Cyanogen	460-19-5					7.8E+01			7.8E+01
				9.0E-02	I			V			1.4E+09		1		~Cyanogen Bromide	506-68-3					7.0E+03			7.0E+03
				5.0E-02	I			V			1.4E+09		1		~Cyanogen Chloride	506-77-4					3.9E+03			3.9E+03
				6.0E-04	I	8.0E-04	I	V		1.0E+07	1.4E+09	5.2E+04	1		~Hydrogen Cyanide	74-90-8					4.7E+01		4.4E+01	2.3E+01
				2.0E-03	I						1.4E+09		1		~Potassium Cyanide	151-50-8					1.6E+02			1.6E+02
				5.0E-03	I						1.4E+09		0.04		~Potassium Silver Cyanide	506-61-6					3.9E+02			3.9E+02
				1.0E-01	I						1.4E+09		0.04		~Silver Cyanide	506-64-9					7.8E+03			7.8E+03
				1.0E-03	I						1.4E+09		1		~Sodium Cyanide	143-33-9					7.8E+01			7.8E+01
				2.0E-04	P						1.4E+09		1		~Thiocyanates	E1790664					1.6E+01			1.6E+01
				2.0E-04	X			V			1.4E+09		1		~Thiocyanic Acid	463-56-9					1.6E+01			1.6E+01
				5.0E-02	I						1.4E+09		1		~Zinc Cyanide	557-21-1					3.9E+03			3.9E+03
						6.0E+00	I	V		1.2E+02	1.4E+09	1.0E+03	1		Cyclohexane	110-82-7							6.5E+03	6.5E+03
2.0E-02	X			2.0E-02	X						1.4E+09		1	0.1	Cyclohexane, 1,2,3,4,5-pentabromo-6-chloro-	87-84-3	3.5E+01	1.2E+02		2.7E+01	1.6E+03	6.6E+03		1.3E+03
				5.0E+00	I	7.0E-01	P	V		5.1E+03	1.4E+09	4.2E+04	1		Cyclohexanone	108-94-1					3.9E+05		3.0E+04	2.8E+04
				5.0E-03	P	1.0E+00	X	V		2.8E+02	1.4E+09	1.5E+03	1		Cyclohexene	110-83-8					3.9E+02		1.5E+03	3.1E+02
				2.0E-01	I			V		2.9E+05	1.4E+09	7.5E+04	1		Cyclohexylamine	108-91-8					1.6E+04			1.6E+04
				2.5E-02	I						1.4E+09		1	0.1	Cyfluthrin	68359-37-5					2.0E+03	8.2E+03		1.6E+03
				1.0E-03	O						1.4E+09		1	0.1	Cyhalothrin	68085-85-8					7.8E+01	3.3E+02		6.3E+01
				6.0E-02	O						1.4E+09		1	0.1	Cypermethrin	52315-07-8					4.7E+03	2.0E+04		3.8E+03
				1.5E-02	O						1.4E+09		1	0.1	Cyromazine	66215-27-8					1.2E+03	4.9E+03		9.5E+02
2.4E-01	I	6.9E-05	C	3.0E-05	X						1.4E+09		1	0.1	DDD, p,p`- (DDD)	72-54-8	2.9E+00	1.0E+01	5.5E+04	2.3E+00	2.3E+00	9.9E+00		1.9E+00
3.4E-01	I	9.7E-05	C	3.0E-04	X			V			1.4E+09	2.1E+06	1		DDE, p,p'-	72-55-9	2.0E+00		6.1E+01	2.0E+00	2.3E+01			2.3E+01
3.4E-01	I	9.7E-05	I	5.0E-04	I						1.4E+09		1	0.03	DDT	50-29-3	2.0E+00	2.4E+01	3.9E+04	1.9E+00	3.9E+01	5.5E+02		3.7E+01
				3.0E-02	I						1.4E+09		1	0.1	Dalapon	75-99-0					2.3E+03	9.9E+03		1.9E+03
1.8E-02	C	5.1E-06	C	1.5E-01	I						1.4E+09		1	0.1	Daminozide	1596-84-5	3.9E+01	1.4E+02	7.5E+05	3.0E+01	1.2E+04	4.9E+04		9.5E+03
7.0E-04	I			7.0E-03	I						1.4E+09		1	0.1	Decabromodiphenyl ether, 2,2',3,3',4,4',5,5',6,6'- (BDE-209)	1163-19-5	9.9E+02	3.5E+03		7.8E+02	5.5E+02	2.3E+03		4.4E+02
				4.0E-05	I						1.4E+09		1	0.1	Demeton	8065-48-3					3.1E+00	1.3E+01		2.5E+00
1.2E-03	I			6.0E-01	I						1.4E+09		1	0.1	Di(2-ethylhexyl)adipate	103-23-1	5.8E+02	2.1E+03		4.5E+02	4.7E+04	2.0E+05		3.8E+04
6.1E-02	H										1.4E+09		1	0.1	Diallate	2303-16-4	1.1E+01	4.1E+01		8.9E+00				
				7.0E-04	A						1.4E+09		1	0.1	Diazinon	333-41-5					5.5E+01	2.3E+02		4.4E+01
				1.0E-02	X			V			1.4E+09	5.2E+05	1		Dibenzothiophene	132-65-0					7.8E+02			7.8E+02
8.0E-01	P	6.0E-03	P	2.0E-04	P	2.0E-04	I	V	M	9.8E+02	1.4E+09	3.2E+04	1		Dibromo-3-chloropropane, 1,2-	96-12-8	1.9E-01		5.4E-03	5.3E-03	1.6E+01		6.7E+00	4.7E+00
				4.0E-04	X			V		1.6E+02	1.4E+09	1.9E+04	1		Dibromobenzene, 1,3-	108-36-1					3.1E+01			3.1E+01
				1.0E-02	I			V			1.4E+09	2.2E+04	1		Dibromobenzene, 1,4-	106-37-6					7.8E+02			7.8E+02
8.4E-02	I			2.0E-02	I			V		8.0E+02	1.4E+09	7.9E+03	1		Dibromochloromethane	124-48-1	8.3E+00			8.3E+00	1.6E+03			1.6E+03

Key: I = IRIS; P = PPRTV; D = DWSHA; O = OPP; A = ATSDR; C = Cal EPA; X = APPENDIX PPRTV SCREEN (See FAQ #29); H = HEAST; F = See FAQ; E = see user guide Section 2.3.5; W = see user guide Section 2.3.6; L = see user guide on lead; M = mutagen; S = see user guide Section 5; V = volatile; R = RBA applied (See User Guide for Arsenic notice) ; c = cancer; n = noncancer; * = where: n SL < 100X c SL; ** = where n SL < 10X c SL; SSL values are based on DAF=1; m = Concentration may exceed ceiling limit (See User Guide); s = Concentration may exceed Csat (See User Guide)

Toxicity and Chemical-specific Information														Contaminant		Carcinogenic Target Risk (TR) = 1E-06				Noncancer Child Hazard Index (HI) = 1			
SFO (mg/kg-day)$^{-1}$	key	IUR (ug/m^3)$^{-1}$	key	RfD_o (mg/kg-day)	key	RfC_i (mg/m^3)	key	vol	muta-gen	C_{sat} (mg/kg)	PEF (m^3/kg)	VF (m^3/kg)	GIABS	ABS	Analyte	CAS No.	Ingestion SL TR=1E-06 (mg/kg)	Dermal SL TR=1E-06 (mg/kg)	Inhalation SL TR=1E-06 (mg/kg)	Carcinogenic SL TR=1E-06 (mg/kg)	Ingestion SL Child THQ=1 (mg/kg)	Dermal SL Child THQ=1 (mg/kg)	Inhalation SL Child THQ=1 (mg/kg)	Noncarcinogenic SL Child THI=1 (mg/kg)
2.0E+00	I	6.0E-04	I	9.0E-03	I	9.0E-03	I	V		1.3E+03	1.4E+09	8.6E+03	1		Dibromoethane, 1,2-	106-93-4	3.5E-01		4.0E-02	3.6E-02	7.0E+02		8.1E+01	7.3E+01
						4.0E-03	X	V		2.8E+03	1.4E+09	5.6E+03	1		Dibromomethane (Methylene Bromide)	74-95-3							2.4E+01	2.4E+01
				3.0E-04	P						1.4E+09		1	0.1	Dibutyltin Compounds	E1790660					2.3E+01	9.9E+01		1.9E+01
				3.0E-02	I						1.4E+09		1	0.1	Dicamba	1918-00-9					2.3E+03	9.9E+03		1.9E+03
		4.2E-03	P					V		5.5E+02	1.4E+09	3.2E+03	1		Dichloro-2-butene, 1,4-	764-41-0			2.1E-03	2.1E-03				
		4.2E-03	P					V		5.2E+02	1.4E+09	1.1E+04	1		Dichloro-2-butene, cis-1,4-	1476-11-5			7.4E-03	7.4E-03				
		4.2E-03	P					V		7.6E+02	1.4E+09	1.1E+04	1		Dichloro-2-butene, trans-1,4-	110-57-6			7.4E-03	7.4E-03				
5.0E-02	I			4.0E-03	I						1.4E+09		1	0.1	Dichloroacetic Acid	79-43-6	1.4E+01	4.9E+01		1.1E+01	3.1E+02	1.3E+03		2.5E+02
				9.0E-02	I	2.0E-01	H	V		3.8E+02	1.4E+09	1.2E+04	1		Dichlorobenzene, 1,2-	95-50-1					7.0E+03		2.4E+03	1.8E+03
5.4E-03	C	1.1E-05	C	7.0E-02	A	8.0E-01	I	V			1.4E+09	1.0E+04	1		Dichlorobenzene, 1,4-	106-46-7	1.3E+02		2.7E+00	2.6E+00	5.5E+03		8.7E+03	3.4E+03
4.5E-01	I	3.4E-04	C								1.4E+09		1	0.1	Dichlorobenzidine, 3,3'-	91-94-1	1.5E+00	5.5E+00	1.1E+04	1.2E+00				
				9.0E-03	X						1.4E+09		1	0.1	Dichlorobenzophenone, 4,4'-	90-98-2					7.0E+02	3.0E+03		5.7E+02
				2.0E-01	I	1.0E-01	X	V		8.5E+02	1.4E+09	8.4E+02	1		Dichlorodifluoromethane	75-71-8					1.6E+04		8.8E+01	8.7E+01
5.7E-03	C	1.6E-06	C	2.0E-01	P			V		1.7E+03	1.4E+09	2.1E+03	1		Dichloroethane, 1,1-	75-34-3	1.2E+02		3.7E+00	3.6E+00	1.6E+04			1.6E+04
9.1E-02	I	2.6E-05	I	6.0E-03	X	7.0E-03	P	V		3.0E+03	1.4E+09	4.6E+03	1		Dichloroethane, 1,2-	107-06-2	7.6E+00		4.9E-01	4.6E-01	4.7E+02		3.3E+01	3.1E+01
				5.0E-02	I	2.0E-01	I	V		1.2E+03	1.4E+09	1.2E+03	1		Dichloroethylene, 1,1-	75-35-4					3.9E+03		2.4E+02	2.3E+02
				2.0E-03	I			V		2.4E+03	1.4E+09	2.5E+03	1		Dichloroethylene, 1,2-cis-	156-59-2					1.6E+02			1.6E+02
				2.0E-02	I			V		1.9E+03	1.4E+09	1.7E+03	1		Dichloroethylene, 1,2-trans-	156-60-5					1.6E+03			1.6E+03
				3.0E-03	I						1.4E+09		1	0.1	Dichlorophenol, 2,4-	120-83-2					2.3E+02	9.9E+02		1.9E+02
				1.0E-02	I						1.4E+09		1	0.05	Dichlorophenoxy Acetic Acid, 2,4-	94-75-7					7.8E+02	6.6E+03		7.0E+02
3.7E-02	P	3.7E-06	P	4.0E-02	P	4.0E-03	I	V		1.4E+03	1.4E+09	3.8E+03	1		Dichloropropane, 1,2-	78-87-5	1.9E+01		2.9E+00	2.5E+00	3.1E+03		1.6E+01	1.6E+01
				2.0E-02	P			V		1.5E+03	1.4E+09	6.8E+03	1		Dichloropropane, 1,3-	142-28-9					1.6E+03			1.6E+03
				3.0E-03	I						1.4E+09		1	0.1	Dichloropropanol, 2,3-	616-23-9					2.3E+02	9.9E+02		1.9E+02
1.0E-01	I	4.0E-06	I	3.0E-02	I	2.0E-02	I	V		1.6E+03	1.4E+09	3.6E+03	1		Dichloropropene, 1,3-	542-75-6	7.0E+00		2.5E+00	1.8E+00	2.3E+03		7.4E+01	7.2E+01
2.9E-01	I	8.3E-05	C	5.0E-04	I	5.0E-04	I				1.4E+09		1	0.1	Dichlorvos	62-73-7	2.4E+00	8.5E+00	4.6E+04	1.9E+00	3.9E+01	1.6E+02	7.1E+05	3.2E+01
				7.0E-05	O						1.4E+09		1	0.1	Dicrotophos	141-66-2					5.5E+00	2.3E+01		4.4E+00
				8.0E-02	P	3.0E-04	X	V		2.6E+02	1.4E+09	4.1E+03	1		Dicyclopentadiene	77-73-6					6.3E+03		1.3E+00	1.3E+00
1.6E+01	I	4.6E-03	I	5.0E-05	I						1.4E+09		1	0.1	Dieldrin	60-57-1	4.3E-02	1.5E-01	8.3E+02	3.4E-02	3.9E+00	1.6E+01		3.2E+00
		3.0E-04	C			5.0E-03	I						1	0.1	Diesel Engine Exhaust	E17136615								
				2.0E-03	P	2.0E-04	P				1.4E+09		1	0.1	Diethanolamine	111-42-2					1.6E+02	6.6E+02	2.8E+05	1.3E+02
				3.0E-02	P	1.0E-04	P				1.4E+09		1	0.1	Diethylene Glycol Monobutyl Ether	112-34-5					2.3E+03	9.9E+03	1.4E+05	1.9E+03
				6.0E-02	P	3.0E-04	P				1.4E+09		1	0.1	Diethylene Glycol Monoethyl Ether	111-90-0					4.7E+03	2.0E+04	4.3E+05	3.8E+03
				1.0E-03	P			V		1.1E+05	1.4E+09	1.4E+05	1		Diethylformamide	617-84-5					7.8E+01			7.8E+01
3.5E+02	C	1.0E-01	C								1.4E+09		1	0.1	Diethylstilbestrol	56-53-1	2.0E-03	7.1E-03	3.8E+01	1.6E-03				
				8.3E-02	O						1.4E+09		1	0.1	Difenzoquat	43222-48-6					6.5E+03	2.7E+04		5.2E+03
				2.0E-02	I						1.4E+09		1	0.1	Diflubenzuron	35367-38-5					1.6E+03	6.6E+03		1.3E+03
						4.0E+01	I	V		1.4E+03	1.4E+09	1.1E+03	1		Difluoroethane, 1,1-	75-37-6							4.8E+04	4.8E+04
						3.0E+01	X	V		6.9E+02	1.4E+09	7.6E+02	1		Difluoropropane, 2,2-	420-45-1							2.4E+04	2.4E+04
4.4E-02	C	1.3E-05	C					V			1.4E+09	1.2E+05	1		Dihydrosafrole	94-58-6	1.6E+01		2.7E+01	9.9E+00				
						7.0E-01	P	V		2.3E+03	1.4E+09	3.1E+03	1		Diisopropyl Ether	108-20-3							2.2E+03	2.2E+03
				8.0E-02	I			V		5.3E+02	1.4E+09	3.8E+04	1		Diisopropyl Methylphosphonate	1445-75-6					6.3E+03			6.3E+03
				2.2E-02	O						1.4E+09		1	0.1	Dimethipin	55290-64-7					1.7E+03	7.2E+03		1.4E+03
				2.2E-03	O						1.4E+09		1	0.1	Dimethoate	60-51-5					1.7E+02	7.3E+02		1.4E+02
1.6E+00	P										1.4E+09		1	0.1	Dimethoxybenzidine, 3,3'-	119-90-4	4.3E-01	1.5E+00		3.4E-01				
1.7E-03	P			6.0E-02	P						1.4E+09		1	0.1	Dimethyl methylphosphonate	756-79-6	4.1E+02	1.5E+03		3.2E+02	4.7E+03	2.0E+04		3.8E+03
4.6E+00	C	1.3E-03	C								1.4E+09		1	0.1	Dimethylamino azobenzene [p-]	60-11-7	1.5E-01	5.4E-01	2.9E+03	1.2E-01				
5.8E-01	H										1.4E+09		1	0.1	Dimethylaniline HCl, 2,4-	21436-96-4	1.2E+00	4.3E+00		9.4E-01				
2.0E-01	P			2.0E-03	X						1.4E+09		1	0.1	Dimethylaniline, 2,4-	95-68-1	3.5E+00	1.2E+01		2.7E+00	1.6E+02	6.6E+02		1.3E+02
2.7E-02	P			2.0E-03	I			V		8.3E+02	1.4E+09	3.1E+04	1		Dimethylaniline, N,N-	121-69-7	2.6E+01			2.6E+01	1.6E+02			1.6E+02
1.1E+01	P										1.4E+09		1	0.1	Dimethylbenzidine, 3,3'-	119-93-7	6.3E-02	2.2E-01		4.9E-02				
				1.0E-01	P	3.0E-02	I	V		1.1E+05	1.4E+09	1.3E+05	1		Dimethylformamide	68-12-2					7.8E+03		4.0E+03	2.6E+03
				1.0E-04	X	2.0E-06	X	V		1.7E+05	1.4E+09	2.8E+04	1		Dimethylhydrazine, 1,1-	57-14-7					7.8E+00		5.8E-02	5.7E-02
5.5E+02	C	1.6E-01	C					V		1.9E+05	1.4E+09	1.7E+05	1		Dimethylhydrazine, 1,2-	540-73-8	1.3E-03		2.9E-03	8.8E-04				
				2.0E-02	I						1.4E+09		1	0.1	Dimethylphenol, 2,4-	105-67-9					1.6E+03	6.6E+03		1.3E+03
				6.0E-04	I						1.4E+09		1	0.1	Dimethylphenol, 2,6-	576-26-1					4.7E+01	2.0E+02		3.8E+01
				1.0E-03	I						1.4E+09		1	0.1	Dimethylphenol, 3,4-	95-65-8					7.8E+01	3.3E+02		6.3E+01
4.5E-02	C	1.3E-05	C					V		4.7E+02	1.4E+09	5.5E+03	1		Dimethylvinylchloride	513-37-1	1.5E+01		1.2E+00	1.1E+00				
				8.0E-05	X						1.4E+09		1	0.1	Dinitro-o-cresol, 4,6-	534-52-1					6.3E+00	2.6E+01		5.1E+00
				2.0E-03	I						1.4E+09		1	0.1	Dinitro-o-cyclohexyl Phenol, 4,6-	131-89-5					1.6E+02	6.6E+02		1.3E+02
				1.0E-04	P						1.4E+09		1	0.1	Dinitrobenzene, 1,2-	528-29-0					7.8E+00	3.3E+01		6.3E+00
				1.0E-04	I						1.4E+09		1	0.1	Dinitrobenzene, 1,3-	99-65-0					7.8E+00	3.3E+01		6.3E+00
				1.0E-04	P						1.4E+09		1	0.1	Dinitrobenzene, 1,4-	100-25-4					7.8E+00	3.3E+01		6.3E+00
				2.0E-03	I						1.4E+09		1	0.1	Dinitrophenol, 2,4-	51-28-5					1.6E+02	6.6E+02		1.3E+02
6.8E-01	I										1.4E+09		1	0.1	Dinitrotoluene Mixture, 2,4/2,6-	E1615210	1.0E+00	3.6E+00		8.0E-01				
3.1E-01	C	8.9E-05	C	2.0E-03	I						1.4E+09		1	0.102	Dinitrotoluene, 2,4-	121-14-2	2.2E+00	7.8E+00	4.3E+04	1.7E+00	1.6E+02	6.5E+02		1.3E+02
1.5E+00	P			3.0E-04	X						1.4E+09		1	0.099	Dinitrotoluene, 2,6-	606-20-2	4.6E-01	1.7E+00		3.6E-01	2.3E+01	1.0E+02		1.9E+01
				2.0E-03	S						1.4E+09		1	0.006	Dinitrotoluene, 2-Amino-4,6-	35572-78-2					1.6E+02	1.1E+04		1.5E+02
				2.0E-03	S						1.4E+09		1	0.009	Dinitrotoluene, 4-Amino-2,6-	19406-51-0					1.6E+02	7.3E+03		1.5E+02
4.5E-01	X			9.0E-04	X						1.4E+09		1	0.1	Dinitrotoluene, Technical grade	25321-14-6	1.5E+00	5.5E+00		1.2E+00	7.0E+01	3.0E+02		5.7E+01

Key: I = IRIS; P = PPRTV; D = DWSHA; O = OPP; A = ATSDR; C = Cal EPA; X = APPENDIX PPRTV SCREEN (See FAQ #29); H = HEAST; F = See FAQ; E = see user guide Section 2.3.5; W = see user guide Section 2.3.6; L = see user guide on lead; M = mutagen; S = see user guide Section 5; V = volatile; R = RBA applied (See User Guide for Arsenic notice) ; c = cancer; n = noncancer; * = where: n SL < 100X c SL; ** = where n SL < 10X c SL; SSL values are based on DAF=1; m = Concentration may exceed ceiling limit (See User Guide); s = Concentration may exceed Csat (See User Guide)

Toxicity and Chemical-specific Information														Contaminant		Carcinogenic Target Risk (TR) = 1E-06				Noncancer Child Hazard Index (HI) = 1			
SFO (mg/kg-day)$^{-1}$	key	IUR (ug/m^3)$^{-1}$	key	RfD_o (mg/kg-day)	key	RfC_i (mg/m^3)	key	vol	muta-gen	C_{sat} (mg/kg)	PEF (m^3/kg)	VF (m^3/kg)	GIABS	ABS	Analyte	CAS No.	Ingestion SL TR=1E-06 (mg/kg)	Dermal SL TR=1E-06 (mg/kg)	Inhalation SL TR=1E-06 (mg/kg)	Carcinogenic SL TR=1E-06 (mg/kg)	Ingestion SL Child THQ=1 (mg/kg)	Dermal SL Child THQ=1 (mg/kg)	Inhalation SL Child THQ=1 (mg/kg)	Noncarcinogenic SL Child THI=1 (mg/kg)
				1.0E-03	I						1.4E+09		1	0.1	Dinoseb	88-85-7					7.8E+01	3.3E+02		6.3E+01
1.0E-01	I	5.0E-06	I	3.0E-02	I	3.0E-02	I	V		1.2E+05	1.4E+09	4.0E+04	1		Dioxane, 1,4-	123-91-1	7.0E+00		2.2E+01	5.3E+00	2.3E+03		1.2E+03	8.1E+02
															Dioxins									
6.2E+03	I	1.3E+00	I								1.4E+09		1	0.03	~Hexachlorodibenzo-p-dioxin, Mixture		1.1E-04	1.3E-03	2.9E+00	1.0E-04				
1.3E+05	C	3.8E+01	C	7.0E-10	I	4.0E-08	C	V			1.4E+09	2.0E+06	1	0.03	~TCDD, 2,3,7,8-	1746-01-6	5.3E-06	6.3E-05	1.4E-04	4.8E-06	5.5E-05	7.7E-04	8.2E-02	5.1E-05
				3.0E-02	I						1.4E+09		1	0.1	Diphenamid	957-51-7					2.3E+03	9.9E+03		1.9E+03
						4.0E-04	X	V			1.4E+09	8.1E+04	1		Diphenyl Ether	101-84-8							3.4E+01	3.4E+01
				8.0E-04	X						1.4E+09		1	0.1	Diphenyl Sulfone	127-63-9					6.3E+01	2.6E+02		5.1E+01
				1.0E-01	O						1.4E+09		1	0.1	Diphenylamine	122-39-4					7.8E+03	3.3E+04		6.3E+03
8.0E-01	I	2.2E-04	I								1.4E+09		1	0.1	Diphenylhydrazine, 1,2-	122-66-7	8.7E-01	3.1E+00	1.7E+04	6.8E-01				
				2.2E-03	I						1.4E+09		1	0.1	Diquat	85-00-7					1.7E+02	7.3E+02		1.4E+02
7.1E+00	C	1.4E-01	C								1.4E+09		1	0.1	Direct Black 38	1937-37-7	9.8E-02	3.5E-01	2.7E+01	7.6E-02				
7.4E+00	C	1.4E-01	C								1.4E+09		1	0.1	Direct Blue 6	2602-46-2	9.4E-02	3.3E-01	2.7E+01	7.3E-02				
6.7E+00	C	1.4E-01	C								1.4E+09		1	0.1	Direct Brown 95	16071-86-6	1.0E-01	3.7E-01	2.7E+01	8.1E-02				
				4.0E-05	I						1.4E+09		1	0.1	Disulfoton	298-04-4					3.1E+00	1.3E+01		2.5E+00
				1.0E-02	I			V			1.4E+09	4.5E+04	1		Dithiane, 1,4-	505-29-3					7.8E+02			7.8E+02
				2.0E-03	I						1.4E+09		1	0.1	Diuron	330-54-1					1.6E+02	6.6E+02		1.3E+02
				2.0E-02	O						1.4E+09		1	0.1	Dodine	2439-10-3					1.6E+03	6.6E+03		1.3E+03
				5.0E-02	O			V			1.4E+09	1.2E+05	1		EPTC	759-94-4					3.9E+03			3.9E+03
				6.0E-03	I			V			1.4E+09	4.1E+05	1		Endosulfan	115-29-7					4.7E+02			4.7E+02
				2.0E-02	I						1.4E+09		1	0.1	Endothall	145-73-3					1.6E+03	6.6E+03		1.3E+03
				3.0E-04	I						1.4E+09		1	0.1	Endrin	72-20-8					2.3E+01	9.9E+01		1.9E+01
9.9E-03	I	1.2E-06	I	6.0E-03	P	1.0E-03	I	V		1.1E+04	1.4E+09	1.9E+04	1		Epichlorohydrin	106-89-8	7.0E+01		4.4E+01	2.7E+01	4.7E+02		2.0E+01	1.9E+01
						2.0E-02	I	V		1.5E+04	1.4E+09	7.7E+03	1		Epoxybutane, 1,2-	106-88-7							1.6E+02	1.6E+02
				4.0E-02	P						1.4E+09		1	0.1	Ethanol, 2-(2-methoxyethoxy)-	111-77-3					3.1E+03	1.3E+04		2.5E+03
				5.0E-03	I						1.4E+09		1	0.1	Ethephon	16672-87-0					3.9E+02	1.6E+03		3.2E+02
				5.0E-04	I						1.4E+09		1	0.1	Ethion	563-12-2					3.9E+01	1.6E+02		3.2E+01
				1.0E-01	P	6.0E-02	P	V		2.4E+04	1.4E+09	6.1E+04	1		Ethoxyethanol Acetate, 2-	111-15-9					7.8E+03		3.8E+03	2.6E+03
				9.0E-02	P	2.0E-01	I	V		1.1E+05	1.4E+09	9.8E+04	1		Ethoxyethanol, 2-	110-80-5					7.0E+03		2.1E+04	5.2E+03
				9.0E-01	I	7.0E-02	P	V		1.1E+04	1.4E+09	8.6E+03	1		Ethyl Acetate	141-78-6					7.0E+04		6.3E+02	6.2E+02
				5.0E-03	P	8.0E-03	P	V		2.5E+03	1.4E+09	6.3E+03	1		Ethyl Acrylate	140-88-5					3.9E+02		5.3E+01	4.7E+01
						1.0E+01	I	V		2.1E+03	1.4E+09	1.3E+03	1		Ethyl Chloride (Chloroethane)	75-00-3							1.4E+04	1.4E+04
				2.0E-01	I			V		1.0E+04	1.4E+09	3.1E+03	1		Ethyl Ether	60-29-7					1.6E+04			1.6E+04
						3.0E-01	P	V		1.1E+03	1.4E+09	5.8E+03	1		Ethyl Methacrylate	97-63-2							1.8E+03	1.8E+03
				1.0E-05	I						1.4E+09		1	0.1	Ethyl-p-nitrophenyl Phosphonate	2104-64-5					7.8E-01	3.3E+00		6.3E-01
1.1E-02	C	2.5E-06	C	1.0E-01	I	1.0E+00	I	V		4.8E+02	1.4E+09	5.7E+03	1		Ethylbenzene	100-41-4	6.3E+01		6.4E+00	5.8E+00	7.8E+03		5.9E+03	3.4E+03
				7.0E-02	P						1.4E+09		1	0.1	Ethylene Cyanohydrin	109-78-4					5.5E+03	2.3E+04		4.4E+03
				9.0E-02	P			V		1.9E+05	1.4E+09	1.8E+05	1		Ethylene Diamine	107-15-3					7.0E+03			7.0E+03
				2.0E+00	I	4.0E-01	C				1.4E+09		1	0.1	Ethylene Glycol	107-21-1					1.6E+05	6.6E+05	5.7E+08	1.3E+05
				1.0E-01	I	1.6E+00	I				1.4E+09		1	0.1	Ethylene Glycol Monobutyl Ether	111-76-2					7.8E+03	3.3E+04	2.3E+09	6.3E+03
3.1E-01	C	3.0E-03	I			3.0E-02	C	V	M	1.2E+05	1.4E+09	6.1E+03	1		Ethylene Oxide	75-21-8	4.9E-01		2.1E-03	2.0E-03			1.9E+02	1.9E+02
4.5E-02	C	1.3E-05	C	8.0E-05	I						1.4E+09		1	0.1	Ethylene Thiourea	96-45-7	1.5E+01	5.5E+01	2.9E+05	1.2E+01	6.3E+00	2.6E+01		5.1E+00
6.5E+01	C	1.9E-02	C					V		1.5E+05	1.4E+09	2.4E+04	1		Ethyleneimine	151-56-4	1.1E-02		3.5E-03	2.7E-03				
				3.0E+00	I						1.4E+09		1	0.1	Ethylphthalyl Ethyl Glycolate	84-72-0					2.3E+05	9.9E+05		1.9E+05
				2.5E-04	I						1.4E+09		1	0.1	Fenamiphos	22224-92-6					2.0E+01	8.2E+01		1.6E+01
				2.5E-02	I						1.4E+09		1	0.1	Fenpropathrin	39515-41-8					2.0E+03	8.2E+03		1.6E+03
				2.5E-02	I						1.4E+09		1	0.1	Fenvalerate	51630-58-1					2.0E+03	8.2E+03		1.6E+03
				1.3E-02	I						1.4E+09		1	0.1	Fluometuron	2164-17-2					1.0E+03	4.3E+03		8.2E+02
				4.0E-02	C	1.3E-02	C				1.4E+09		1		Fluoride	16984-48-8					3.1E+03		1.8E+07	3.1E+03
				6.0E-02	I	1.3E-02	C				1.4E+09		1		Fluorine (Soluble Fluoride)	7782-41-4					4.7E+03		1.8E+07	4.7E+03
				8.0E-02	I						1.4E+09		1	0.1	Fluridone	59756-60-4					6.3E+03	2.6E+04		5.1E+03
				1.5E-02	O						1.4E+09		1	0.1	Flurprimidol	56425-91-3					1.2E+03	4.9E+03		9.5E+02
				2.0E-03	O						1.4E+09		1	0.1	Flusilazole	85509-19-9					1.6E+02	6.6E+02		1.3E+02
				5.0E-01	O						1.4E+09		1	0.1	Flutolanil	66332-96-5					3.9E+04	1.6E+05		3.2E+04
				1.0E-02	I						1.4E+09		1	0.1	Fluvalinate	69409-94-5					7.8E+02	3.3E+03		6.3E+02
				9.0E-02	O						1.4E+09		1	0.1	Folpet	133-07-3					7.0E+03	3.0E+04		5.7E+03
				2.5E-03	O						1.4E+09		1	0.1	Fomesafen	72178-02-0					2.0E+02	8.2E+02		1.6E+02
				2.0E-03	I						1.4E+09		1	0.1	Fonofos	944-22-9					1.6E+02	6.6E+02		1.3E+02
		1.3E-05	I	2.0E-01	I	9.8E-03	A	V		4.2E+04	1.4E+09	7.8E+04	1		Formaldehyde	50-00-0			1.7E+01	1.7E+01	1.6E+04		8.0E+02	7.6E+02
				9.0E-01	P	3.0E-04	X	V		1.1E+05	1.4E+09	9.3E+04	1		Formic Acid	64-18-6					7.0E+04		2.9E+01	2.9E+01
				2.5E+00	O						1.4E+09		1	0.1	Fosetyl-AL	39148-24-8					2.0E+05	8.2E+05		1.6E+05
															Furans									
				1.0E-03	X			V			1.4E+09	1.6E+05	1	0.03	~Dibenzofuran	132-64-9					7.8E+01	1.1E+03		7.3E+01
				1.0E-03	I			V		6.2E+03	1.4E+09	2.6E+03	1	0.03	~Furan	110-00-9					7.8E+01	1.1E+03		7.3E+01
				9.0E-01	I	2.0E+00	I	V		1.7E+05	1.4E+09	1.2E+04	1	0.03	~Tetrahydrofuran	109-99-9					7.0E+04	9.9E+05	2.5E+04	1.8E+04
3.8E+00	H										1.4E+09		1	0.1	Furazolidone	67-45-8	1.8E-01	6.5E-01		1.4E-01				
				3.0E-03	I	5.0E-02	H	V		1.0E+04	1.4E+09	4.9E+04	1		Furfural	98-01-1					2.3E+02		2.5E+03	2.1E+02
1.5E+00	C	4.3E-04	C								1.4E+09		1	0.1	Furium	531-82-8	4.6E-01	1.6E+00	8.9E+03	3.6E-01				
3.0E-02	I	8.6E-06	C								1.4E+09		1	0.1	Furmecyclox	60568-05-0	2.3E+01	8.2E+01	4.4E+05	1.8E+01				

Key: I = IRIS; P = PPRTV; D = DWSHA; O = OPP; A = ATSDR; C = Cal EPA; X = APPENDIX PPRTV SCREEN (See FAQ #29); H = HEAST; F = See FAQ; E = see user guide Section 2.3.5; W = see user guide Section 2.3.6; L = see user guide on lead; M = mutagen; S = see user guide Section 5; V = volatile; R = RBA applied (See User Guide for Arsenic notice) ; c = cancer; n = noncancer; * = where: n SL < 100X c SL; ** = where n SL < 10X c SL; SSL values are based on DAF=1; m = Concentration may exceed ceiling limit (See User Guide); s = Concentration may exceed Csat (See User Guide)

Toxicity and Chemical-specific Information														Contaminant		Carcinogenic Target Risk (TR) = 1E-06				Noncancer Child Hazard Index (HI) = 1			
SFO (mg/kg-day)$^{-1}$	key	IUR (ug/m^3)$^{-1}$	key	RfD_o (mg/kg-day)	key	RfC_i (mg/m^3)	key	vol	muta-gen	C_{sat} (mg/kg)	PEF (m^3/kg)	VF (m^3/kg)	GIABS	ABS	Analyte	CAS No.	Ingestion SL TR=1E-06 (mg/kg)	Dermal SL TR=1E-06 (mg/kg)	Inhalation SL TR=1E-06 (mg/kg)	Carcinogenic SL TR=1E-06 (mg/kg)	Ingestion SL Child THQ=1 (mg/kg)	Dermal SL Child THQ=1 (mg/kg)	Inhalation SL Child THQ=1 (mg/kg)	Noncarcinogenic SL Child THI=1 (mg/kg)
				6.0E-03	O						1.4E+09		1	0.1	Glufosinate, Ammonium	77182-82-2					4.7E+02	2.0E+03		3.8E+02
				1.0E-01	A	8.0E-05	C				1.4E+09		1	0.1	Glutaraldehyde	111-30-8					7.8E+03	3.3E+04	1.1E+05	6.0E+03
				4.0E-04	I	1.0E-03	H	V		1.1E+05	1.4E+09	8.4E+04	1		Glycidyl	765-34-4					3.1E+01		8.8E+01	2.3E+01
				1.0E-01	I						1.4E+09		1	0.1	Glyphosate	1071-83-6					7.8E+03	3.3E+04		6.3E+03
				1.0E-02	X			V			1.4E+09	1.5E+05	1		Guanidine	113-00-8					7.8E+02			7.8E+02
				2.0E-02	P						1.4E+09		1	0.1	Guanidine Chloride	50-01-1					1.6E+03	6.6E+03		1.3E+03
				3.0E-02	X						1.4E+09		1	0.1	Guanidine Nitrate	506-93-4					2.3E+03	9.9E+03		1.9E+03
				5.0E-05	I						1.4E+09		1	0.1	Haloxyfop, Methyl	69806-40-2					3.9E+00	1.6E+01		3.2E+00
4.5E+00	I	1.3E-03	I	5.0E-04	I			V			1.4E+09	4.8E+05	1		Heptachlor	76-44-8	1.5E-01		1.0E+00	1.3E-01	3.9E+01			3.9E+01
9.1E+00	I	2.6E-03	I	1.3E-05	I			V			1.4E+09	8.4E+05	1		Heptachlor Epoxide	1024-57-3	7.6E-02		9.1E-01	7.0E-02	1.0E+00			1.0E+00
						3.0E-03	X	V		2.1E+02	1.4E+09	7.8E+03	1		Heptanal, n-	111-71-7							2.4E+01	2.4E+01
				3.0E-04	X	4.0E-01	P	V		5.8E+01	1.4E+09	8.9E+02	1		Heptane, N-	142-82-5					2.3E+01		3.7E+02	2.2E+01
				2.0E-03	I			V			1.4E+09	3.8E+05	1		Hexabromobenzene	87-82-1					1.6E+02			1.6E+02
				2.0E-04	I						1.4E+09		1	0.1	Hexabromodiphenyl ether, 2,2',4,4',5,5'- (BDE-153)	68631-49-2					1.6E+01	6.6E+01		1.3E+01
1.6E+00	I	4.6E-04	I	8.0E-04	I			V			1.4E+09	6.8E+04	1		Hexachlorobenzene	118-74-1	4.3E-01		4.1E-01	2.1E-01	6.3E+01			6.3E+01
7.8E-02	I	2.2E-05	I	1.0E-03	P			V		1.7E+01	1.4E+09	1.1E+04	1		Hexachlorobutadiene	87-68-3	8.9E+00		1.4E+00	1.2E+00	7.8E+01			7.8E+01
6.3E+00	I	1.8E-03	I	8.0E-03	A						1.4E+09		1	0.1	Hexachlorocyclohexane, Alpha-	319-84-6	1.1E-01	3.9E-01	2.1E+03	8.6E-02	6.3E+02	2.6E+03		5.1E+02
1.8E+00	I	5.3E-04	I								1.4E+09		1	0.1	Hexachlorocyclohexane, Beta-	319-85-7	3.9E-01	1.4E+00	7.2E+03	3.0E-01				
1.1E+00	C	3.1E-04	C	3.0E-04	I						1.4E+09		1	0.04	Hexachlorocyclohexane, Gamma- (Lindane)	58-89-9	6.3E-01	5.6E+00	1.2E+04	5.7E-01	2.3E+01	2.5E+02		2.1E+01
1.8E+00	I	5.1E-04	I								1.4E+09		1	0.1	Hexachlorocyclohexane, Technical	608-73-1	3.9E-01	1.4E+00	7.5E+03	3.0E-01				
				6.0E-03	I	2.0E-04	I	V		1.6E+01	1.4E+09	8.5E+03	1		Hexachlorocyclopentadiene	77-47-4					4.7E+02		1.8E+00	1.8E+00
4.0E-02	I	1.1E-05	C	7.0E-04	I	3.0E-02	I	V			1.4E+09	8.0E+03	1		Hexachloroethane	67-72-1	1.7E+01		2.0E+00	1.8E+00	5.5E+01		2.5E+02	4.5E+01
				3.0E-04	I						1.4E+09		1	0.1	Hexachlorophene	70-30-4					2.3E+01	9.9E+01		1.9E+01
1.1E-01	I			3.0E-03	I						1.4E+09		1	0.015	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	121-82-4	6.3E+00	1.5E+02		6.1E+00	2.3E+02	6.6E+03		2.3E+02
						1.0E-05	I	V		3.4E+03	1.4E+09	3.0E+05	1		Hexamethylene Diisocyanate, 1,6-	822-06-0							3.1E+00	3.1E+00
				4.0E-04	P						1.4E+09		1	0.1	Hexamethylphosphoramide	680-31-9					3.1E+01	1.3E+02		2.5E+01
						7.0E-01	I	V		1.4E+02	1.4E+09	8.3E+02	1		Hexane, N-	110-54-3							6.1E+02	6.1E+02
				2.0E+00	P						1.4E+09		1	0.1	Hexanedioic Acid	124-04-9					1.6E+05	6.6E+05		1.3E+05
				5.0E-03	I	3.0E-02	I	V		3.3E+03	1.4E+09	1.3E+04	1		Hexanone, 2-	591-78-6					3.9E+02		4.2E+02	2.0E+02
				3.3E-02	I						1.4E+09		1	0.1	Hexazinone	51235-04-2					2.6E+03	1.1E+04		2.1E+03
				2.5E-02	I						1.4E+09		1	0.1	Hexythiazox	78587-05-0					2.0E+03	8.2E+03		1.6E+03
				1.7E-02	O						1.4E+09		1	0.1	Hydramethylnon	67485-29-4					1.3E+03	5.6E+03		1.1E+03
3.0E+00	I	4.9E-03	I			3.0E-05	P	V			1.4E+09		1		Hydrazine	302-01-2	2.3E-01		7.8E+02	2.3E-01			4.3E+04	4.3E+04
3.0E+00	I	4.9E-03	I								1.4E+09		1		Hydrazine Sulfate	10034-93-2	2.3E-01		7.8E+02	2.3E-01				
						2.0E-02	I	V			1.4E+09		1		Hydrogen Chloride	7647-01-0							2.8E+07	2.8E+07
				4.0E-02	C	1.4E-02	C	V			1.4E+09		1		Hydrogen Fluoride	7664-39-3					3.1E+03		2.0E+07	3.1E+03
						2.0E-03	I	V			1.4E+09		1		Hydrogen Sulfide	7783-06-4							2.8E+06	2.8E+06
6.0E-02	P			4.0E-02	P						1.4E+09		1	0.1	Hydroquinone	123-31-9	1.2E+01	4.1E+01		9.0E+00	3.1E+03	1.3E+04		2.5E+03
6.1E-02	O			2.5E-03	O						1.4E+09		1	0.1	Imazalil	35554-44-0	1.1E+01	4.0E+01		8.9E+00	2.0E+02	8.2E+02		1.6E+02
				2.5E-01	I						1.4E+09		1	0.1	Imazaquin	81335-37-7					2.0E+04	8.2E+04		1.6E+04
				2.5E+00	O						1.4E+09		1	0.1	Imazethapyr	81335-77-5					2.0E+05	8.2E+05		1.6E+05
				1.0E-02	A						1.4E+09		1		Iodine	7553-56-2					7.8E+02			7.8E+02
				4.0E-02	I						1.4E+09		1	0.1	Iprodione	36734-19-7					3.1E+03	1.3E+04		2.5E+03
				7.0E-01	P						1.4E+09		1		Iron	7439-89-6					5.5E+04			5.5E+04
				3.0E-01	I			V		1.0E+04	1.4E+09	2.8E+04	1		Isobutyl Alcohol	78-83-1					2.3E+04			2.3E+04
9.5E-04	I			2.0E-01	I	2.0E+00	C				1.4E+09		1	0.1	Isophorone	78-59-1	7.3E+02	2.6E+03		5.7E+02	1.6E+04	6.6E+04	2.8E+09	1.3E+04
				1.5E-02	I			V			1.4E+09	4.2E+05	1		Isopropalin	33820-53-0					1.2E+03			1.2E+03
				2.0E+00	P	2.0E-01	P	V		1.1E+05	1.4E+09	2.8E+04	1		Isopropanol	67-63-0					1.6E+05		5.8E+03	5.6E+03
				1.0E-01	I						1.4E+09		1	0.1	Isopropyl Methyl Phosphonic Acid	1832-54-8					7.8E+03	3.3E+04		6.3E+03
				5.0E-02	I						1.4E+09		1	0.1	Isoxaben	82558-50-7					3.9E+03	1.6E+04		3.2E+03
						3.0E-01	A	V			1.4E+09		1		JP-7	E1737665							4.3E+08	4.3E+08
				8.0E-03	O						1.4E+09		1	0.1	Lactofen	77501-63-4					6.3E+02	2.6E+03		5.1E+02
				2.0E-04	X						1.4E+09		1	0.1	Lactonitrile	78-97-7					1.6E+01	6.6E+01		1.3E+01
															Lead Compounds									
8.5E-03	C	1.2E-05	C								1.4E+09		1		~Lead Phosphate	7446-27-7	8.2E+01		3.2E+05	8.2E+01				
8.5E-03	C	1.2E-05	C								1.4E+09		1	0.1	~Lead acetate	301-04-2	8.2E+01	2.9E+02	3.2E+05	6.4E+01				
											1.4E+09		1		~Lead and Compounds	7439-92-1								4.0E+02
8.5E-03	C	1.2E-05	C								1.4E+09		1	0.1	~Lead subacetate	1335-32-6	8.2E+01	2.9E+02	3.2E+05	6.4E+01				
				1.0E-07	I			V		2.4E+00	1.4E+09	1.9E+03	1		~Tetraethyl Lead	78-00-2					7.8E-03			7.8E-03
				5.0E-06	P			V		3.8E+02	1.4E+09	2.6E+04	1		Lewisite	541-25-3					3.9E-01			3.9E-01
				7.7E-03	O						1.4E+09		1	0.1	Linuron	330-55-2					6.0E+02	2.5E+03		4.9E+02
				2.0E-03	P						1.4E+09		1		Lithium	7439-93-2					1.6E+02			1.6E+02
				5.0E-04	I						1.4E+09		1	0.1	MCPA	94-74-6					3.9E+01	1.6E+02		3.2E+01
				4.4E-03	O						1.4E+09		1	0.1	MCPB	94-81-5					3.4E+02	1.5E+03		2.8E+02
				1.0E-03	I						1.4E+09		1	0.1	MCPP	93-65-2					7.8E+01	3.3E+02		6.3E+01
				2.0E-02	I						1.4E+09		1	0.1	Malathion	121-75-5					1.6E+03	6.6E+03		1.3E+03
				1.0E-01	I	7.0E-04	C				1.4E+09		1	0.1	Maleic Anhydride	108-31-6					7.8E+03	3.3E+04	9.9E+05	6.3E+03
				5.0E-01	I						1.4E+09		1	0.1	Maleic Hydrazide	123-33-1					3.9E+04	1.6E+05		3.2E+04
				1.0E-04	P						1.4E+09		1	0.1	Malononitrile	109-77-3					7.8E+00	3.3E+01		6.3E+00

Key: I = IRIS; P = PPRTV; D = DWSHA; O = OPP; A = ATSDR; C = Cal EPA; X = APPENDIX PPRTV SCREEN (See FAQ #29); H = HEAST; F = See FAQ; E = see user guide Section 2.3.5; W = see user guide Section 2.3.6; L = see user guide on lead; M = mutagen; S = see user guide Section 5; V = volatile; R = RBA applied (See User Guide for Arsenic notice) ; c = cancer; n = noncancer; * = where: n SL < 100X c SL; ** = where n SL < 10X c SL; SSL values are based on DAF=1; m = Concentration may exceed ceiling limit (See User Guide); s = Concentration may exceed Csat (See User Guide)

Toxicity and Chemical-specific Information														Contaminant		Carcinogenic Target Risk (TR) = 1E-06				Noncancer Child Hazard Index (HI) = 1			
SFO (mg/kg-day)$^{-1}$	key	IUR (ug/m^3)$^{-1}$	key	RfD_o (mg/kg-day)	key	RfC_i (mg/m^3)	key	vol	muta-gen	C_{sat} (mg/kg)	PEF (m^3/kg)	VF (m^3/kg)	GIABS	ABS	Analyte	CAS No.	Ingestion SL TR=1E-06 (mg/kg)	Dermal SL TR=1E-06 (mg/kg)	Inhalation SL TR=1E-06 (mg/kg)	Carcinogenic SL TR=1E-06 (mg/kg)	Ingestion SL Child THQ=1 (mg/kg)	Dermal SL Child THQ=1 (mg/kg)	Inhalation SL Child THQ=1 (mg/kg)	Noncarcinogenic SL Child THI=1 (mg/kg)
				3.0E-02	H						1.4E+09		1	0.1	Mancozeb	8018-01-7					2.3E+03	9.9E+03		1.9E+03
				5.0E-03	I						1.4E+09		1	0.1	Maneb	12427-38-2					3.9E+02	1.6E+03		3.2E+02
				1.4E-01	I	5.0E-05	I						1		Manganese (Diet)	7439-96-5								
				2.4E-02	S	5.0E-05	I				1.4E+09		0.04		Manganese (Non-diet)	7439-96-5					1.9E+03		7.1E+04	1.8E+03
				9.0E-05	H						1.4E+09		1	0.1	Mephosfolan	950-10-7					7.0E+00	3.0E+01		5.7E+00
				3.0E-02	I						1.4E+09		1	0.1	Mepiquat Chloride	24307-26-4					2.3E+03	9.9E+03		1.9E+03
1.1E-02	P			4.0E-03	P						1.4E+09		1	0.1	Mercaptobenzothiazole, 2-	149-30-4	6.3E+01	2.2E+02		4.9E+01	3.1E+02	1.3E+03		2.5E+02
															Mercury Compounds									
				3.0E-04	I	3.0E-04	S				1.4E+09		0.07		~Mercuric Chloride (and other Mercury salts)	7487-94-7					2.3E+01		4.3E+05	2.3E+01
						3.0E-04	I	V		3.1E+00	1.4E+09	3.5E+04	1		~Mercury (elemental)	7439-97-6							1.1E+01	1.1E+01
				1.0E-04	I						1.4E+09		1		~Methyl Mercury	22967-92-6					7.8E+00			7.8E+00
				8.0E-05	I						1.4E+09		1	0.1	~Phenylmercuric Acetate	62-38-4					6.3E+00	2.6E+01		5.1E+00
				3.0E-05	I			V			1.4E+09	1.9E+06	1		Merphos	150-50-5					2.3E+00			2.3E+00
				1.0E-04	O						1.4E+09		1	0.1	Merphos Oxide	78-48-8					7.8E+00	3.3E+01		6.3E+00
				6.0E-02	I						1.4E+09		1	0.1	Metalaxyl	57837-19-1					4.7E+03	2.0E+04		3.8E+03
				1.0E-04	I	3.0E-02	P	V		4.6E+03	1.4E+09	6.8E+03	1		Methacrylonitrile	126-98-7					7.8E+00		2.1E+02	7.5E+00
				5.0E-05	I						1.4E+09		1	0.1	Methamidophos	10265-92-6					3.9E+00	1.6E+01		3.2E+00
				2.0E+00	I	2.0E+01	I	V		1.1E+05	1.4E+09	2.9E+04	1		Methanol	67-56-1					1.6E+05		6.1E+05	1.2E+05
				1.5E-03	O						1.4E+09		1	0.1	Methidathion	950-37-8					1.2E+02	4.9E+02		9.5E+01
				2.5E-02	I						1.4E+09		1	0.1	Methomyl	16752-77-5					2.0E+03	8.2E+03		1.6E+03
4.9E-02	C	1.4E-05	C								1.4E+09		1	0.1	Methoxy-5-nitroaniline, 2-	99-59-2	1.4E+01	5.0E+01	2.7E+05	1.1E+01				
				5.0E-03	I						1.4E+09		1	0.1	Methoxychlor	72-43-5					3.9E+02	1.6E+03		3.2E+02
				8.0E-03	P	1.0E-03	P	V		1.2E+05	1.4E+09	1.2E+05	1		Methoxyethanol Acetate, 2-	110-49-6					6.3E+02		1.3E+02	1.1E+02
				5.0E-03	P	2.0E-02	I	V		1.1E+05	1.4E+09	1.0E+05	1		Methoxyethanol, 2-	109-86-4					3.9E+02		2.1E+03	3.3E+02
				1.0E+00	X			V		2.9E+04	1.4E+09	8.1E+03	1		Methyl Acetate	79-20-9					7.8E+04			7.8E+04
						2.0E-02	P	V		6.8E+03	1.4E+09	7.0E+03	1		Methyl Acrylate	96-33-3							1.5E+02	1.5E+02
				6.0E-01	I	5.0E+00	I	V		2.8E+04	1.4E+09	1.2E+04	1		Methyl Ethyl Ketone (2-Butanone)	78-93-3					4.7E+04		6.4E+04	2.7E+04
		1.0E-03	X	1.0E-03	P	2.0E-05	X	V		1.8E+05	1.4E+09	5.0E+04	1		Methyl Hydrazine	60-34-4			1.4E-01	1.4E-01	7.8E+01		1.1E+00	1.0E+00
						3.0E+00	I	V		3.4E+03	1.4E+09	1.1E+04	1		Methyl Isobutyl Ketone (4-methyl-2-pentanone)	108-10-1							3.3E+04	3.3E+04
						1.0E-03	C	V		1.0E+04	1.4E+09	4.4E+03	1		Methyl Isocyanate	624-83-9							4.6E+00	4.6E+00
				1.4E+00	I	7.0E-01	I	V		2.4E+03	1.4E+09	6.3E+03	1		Methyl Methacrylate	80-62-6					1.1E+05		4.6E+03	4.4E+03
				2.5E-04	I						1.4E+09		1	0.1	Methyl Parathion	298-00-0					2.0E+01	8.2E+01		1.6E+01
				6.0E-02	X						1.4E+09		1	0.1	Methyl Phosphonic Acid	993-13-5					4.7E+03	2.0E+04		3.8E+03
				6.0E-03	H	4.0E-02	H	V		3.9E+02	1.4E+09	2.4E+04	1		Methyl Styrene (Mixed Isomers)	25013-15-4					4.7E+02		1.0E+03	3.2E+02
9.9E-02	C	2.8E-05	C								1.4E+09		1	0.1	Methyl methanesulfonate	66-27-3	7.0E+00	2.5E+01	1.4E+05	5.5E+00				
1.8E-03	C	2.6E-07	C			3.0E+00	I	V		8.9E+03	1.4E+09	4.9E+03	1		Methyl tert-Butyl Ether (MTBE)	1634-04-4	3.9E+02		5.3E+01	4.7E+01			1.5E+04	1.5E+04
				3.0E-04	X						1.4E+09		1	0.1	Methyl-1,4-benzenediamine dihydrochloride, 2-	615-45-2					2.3E+01	9.9E+01		1.9E+01
						3.0E+00	X	V		2.5E+03	1.4E+09	1.7E+04	1		Methyl-2-Pentanol, 4-	108-11-2							5.4E+04	5.4E+04
9.0E-03	P			2.0E-02	X						1.4E+09		1	0.1	Methyl-5-Nitroaniline, 2-	99-55-8	7.7E+01	2.7E+02		6.0E+01	1.6E+03	6.6E+03		1.3E+03
8.3E+00	C	2.4E-03	C								1.4E+09		1	0.1	Methyl-N-nitro-N-nitrosoguanidine, N-	70-25-7	8.4E-02	3.0E-01	1.6E+03	6.5E-02				
1.3E-01	C	3.7E-05	C								1.4E+09		1	0.1	Methylaniline Hydrochloride, 2-	636-21-5	5.3E+00	1.9E+01	1.0E+05	4.2E+00				
				1.0E-02	A						1.4E+09		1	0.1	Methylarsonic acid	124-58-3					7.8E+02	3.3E+03		6.3E+02
				2.0E-04	X						1.4E+09		1	0.1	Methylbenzene,1-4-diamine monohydrochloride, 2-	74612-12-7					1.6E+01	6.6E+01		1.3E+01
1.0E-01	X			3.0E-04	X						1.4E+09		1	0.1	Methylbenzene-1,4-diamine sulfate, 2-	615-50-9	7.0E+00	2.5E+01		5.4E+00	2.3E+01	9.9E+01		1.9E+01
2.2E+01	C	6.3E-03	C						M		1.4E+09		1	0.1	Methylcholanthrene, 3-	56-49-5	7.0E-03	2.7E-02	2.2E+02	5.5E-03				
2.0E-03	I	1.0E-08	I	6.0E-03	I	6.0E-01	I	V	M	3.3E+03	1.4E+09	2.2E+03	1		Methylene Chloride	75-09-2	7.7E+01		2.2E+02	5.7E+01	4.7E+02		1.4E+03	3.5E+02
1.0E-01	P	4.3E-04	C	2.0E-03	P				M		1.4E+09		1	0.1	Methylene-bis(2-chloroaniline), 4,4'-	101-14-4	1.5E+00	6.0E+00	3.2E+03	1.2E+00	1.6E+02	6.6E+02		1.3E+02
4.6E-02	I	1.3E-05	C								1.4E+09		1	0.1	Methylene-bis(N,N-dimethyl) Aniline, 4,4'-	101-61-1	1.5E+01	5.4E+01	2.9E+05	1.2E+01				
1.6E+00	C	4.6E-04	C			2.0E-02	C				1.4E+09		1	0.1	Methylenebisbenzenamine, 4,4'-	101-77-9	4.3E-01	1.5E+00	8.3E+03	3.4E-01			2.8E+07	2.8E+07
						6.0E-04	I				1.4E+09		1	0.1	Methylenediphenyl Diisocyanate	101-68-8							8.5E+05	8.5E+05
				7.0E-02	H			V		5.0E+02	1.4E+09	1.3E+04	1		Methylstyrene, Alpha-	98-83-9					5.5E+03			5.5E+03
				1.5E-01	I						1.4E+09		1	0.1	Metolachlor	51218-45-2					1.2E+04	4.9E+04		9.5E+03
				2.5E-02	I						1.4E+09		1	0.1	Metribuzin	21087-64-9					2.0E+03	8.2E+03		1.6E+03
				2.5E-01	I						1.4E+09		1	0.1	Metsulfuron-methyl	74223-64-6					2.0E+04	8.2E+04		1.6E+04
				3.0E+00	P			V		3.4E-01	1.4E+09	1.4E+03	1		Mineral oils	8012-95-1					2.3E+05			2.3E+05
1.8E+01	C	5.1E-03	C	2.0E-04	I			V			1.4E+09	8.6E+05	1		Mirex	2385-85-5	3.9E-02		4.7E-01	3.6E-02	1.6E+01			1.6E+01
				2.0E-03	I						1.4E+09		1	0.1	Molinate	2212-67-1					1.6E+02	6.6E+02		1.3E+02
				5.0E-03	I						1.4E+09		1		Molybdenum	7439-98-7					3.9E+02			3.9E+02
				1.0E-01	I						1.4E+09		1		Monochloramine	10599-90-3					7.8E+03			7.8E+03
				2.0E-03	P						1.4E+09		1	0.1	Monomethylaniline	100-61-8					1.6E+02	6.6E+02		1.3E+02
				2.5E-02	I						1.4E+09		1	0.1	Myclobutanil	88671-89-0					2.0E+03	8.2E+03		1.6E+03
				3.0E-04	X						1.4E+09		1	0.1	N,N'-Diphenyl-1,4-benzenediamine	74-31-7					2.3E+01	9.9E+01		1.9E+01
				2.0E-03	I			V			1.4E+09	5.7E+04	1		Naled	300-76-5					1.6E+02			1.6E+02
				3.0E-02	X	1.0E-01	P	V			1.4E+09		1		Naphtha, High Flash Aromatic (HFAN)	64742-95-6					2.3E+03		1.4E+08	2.3E+03
1.8E+00	C	0.0E+00	C								1.4E+09		1	0.1	Naphthylamine, 2-	91-59-8	3.9E-01	1.4E+00		3.0E-01				
				1.2E-01	O						1.4E+09		1	0.1	Napropamide	15299-99-7					9.4E+03	4.0E+04		7.6E+03
		2.6E-04	C	1.1E-02	C	1.4E-05	C				1.4E+09		1	0.1	Nickel Acetate	373-02-4			1.5E+04	1.5E+04	8.6E+02	3.6E+03	2.0E+04	6.7E+02
		2.6E-04	C	1.1E-02	C	1.4E-05	C				1.4E+09		1	0.1	Nickel Carbonate	3333-67-3			1.5E+04	1.5E+04	8.6E+02	3.6E+03	2.0E+04	6.7E+02
		2.6E-04	C	1.1E-02	C	1.4E-05	C	V			1.4E+09		1		Nickel Carbonyl	13463-39-3			1.5E+04	1.5E+04	8.6E+02		2.0E+04	8.2E+02

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Toxicity and Chemical-specific Information														Contaminant		Carcinogenic Target Risk (TR) = 1E-06				Noncancer Child Hazard Index (HI) = 1			
SFO (mg/kg-day)$^{-1}$	key	IUR (ug/m^3)$^{-1}$	key	RfD_o (mg/kg-day)	key	RfC_i (mg/m^3)	key	vol	muta-gen	C_{sat} (mg/kg)	PEF (m^3/kg)	VF (m^3/kg)	GIABS	ABS	Analyte	CAS No.	Ingestion SL TR=1E-06 (mg/kg)	Dermal SL TR=1E-06 (mg/kg)	Inhalation SL TR=1E-06 (mg/kg)	Carcinogenic SL TR=1E-06 (mg/kg)	Ingestion SL Child THQ=1 (mg/kg)	Dermal SL Child THQ=1 (mg/kg)	Inhalation SL Child THQ=1 (mg/kg)	Noncarcinogenic SL Child THI=1 (mg/kg)
		2.6E-04	C	1.1E-02	C	1.4E-05	C				1.4E+09		0.04		Nickel Hydroxide	12054-48-7			1.5E+04	1.5E+04	8.6E+02		2.0E+04	8.2E+02
		2.6E-04	C	1.1E-02	C	2.0E-05	C				1.4E+09		0.04		Nickel Oxide	1313-99-1			1.5E+04	1.5E+04	8.6E+02		2.8E+04	8.4E+02
		2.4E-04	I	1.1E-02	C	1.4E-05	C				1.4E+09		0.04		Nickel Refinery Dust	E715532			1.6E+04	1.6E+04	8.6E+02		2.0E+04	8.2E+02
		2.6E-04	C	2.0E-02	I	9.0E-05	A				1.4E+09		0.04		Nickel Soluble Salts	7440-02-0			1.5E+04	1.5E+04	1.6E+03		1.3E+05	1.5E+03
1.7E+00	C	4.8E-04	I	1.1E-02	C	1.4E-05	C				1.4E+09		0.04		Nickel Subsulfide	12035-72-2	4.1E-01		8.0E+03	4.1E-01	8.6E+02		2.0E+04	8.2E+02
		2.6E-04	C	1.1E-02	C	1.4E-05	C				1.4E+09		1	0.1	Nickelocene	1271-28-9			1.5E+04	1.5E+04	8.6E+02	3.6E+03	2.0E+04	6.7E+02
				1.6E+00	I						1.4E+09		1		Nitrate	14797-55-8					1.3E+05			1.3E+05
											1.4E+09		1		Nitrate + Nitrite (as N)	E701177								
				1.0E-01	I						1.4E+09		1		Nitrite	14797-65-0					7.8E+03			7.8E+03
				1.0E-02	X	5.0E-05	X				1.4E+09		1	0.1	Nitroaniline, 2-	88-74-4					7.8E+02	3.3E+03	7.1E+04	6.3E+02
2.0E-02	P			4.0E-03	P	6.0E-03	P				1.4E+09		1	0.1	Nitroaniline, 4-	100-01-6	3.5E+01	1.2E+02		2.7E+01	3.1E+02	1.3E+03	8.5E+06	2.5E+02
		4.0E-05	I	2.0E-03	I	9.0E-03	I	V		3.1E+03	1.4E+09	7.3E+04	1		Nitrobenzene	98-95-3			5.1E+00	5.1E+00	1.6E+02		6.9E+02	1.3E+02
				3.0E+03	P						1.4E+09		1	0.1	Nitrocellulose	9004-70-0					2.3E+08	9.9E+08		1.9E+08
				7.0E-02	H						1.4E+09		1	0.1	Nitrofurantoin	67-20-9					5.5E+03	2.3E+04		4.4E+03
1.3E+00	C	3.7E-04	C								1.4E+09		1	0.1	Nitrofurazone	59-87-0	5.3E-01	1.9E+00	1.0E+04	4.2E-01				
1.7E-02	P			1.0E-04	P						1.4E+09		1	0.1	Nitroglycerin	55-63-0	4.1E+01	1.5E+02		3.2E+01	7.8E+00	3.3E+01		6.3E+00
				1.0E-01	I						1.4E+09		1	0.1	Nitroguanidine	556-88-7					7.8E+03	3.3E+04		6.3E+03
		8.8E-06	P			5.0E-03	P	V		1.8E+04	1.4E+09	1.7E+04	1		Nitromethane	75-52-5			5.4E+00	5.4E+00			8.8E+01	8.8E+01
		2.7E-03	H			2.0E-02	I	V		4.9E+03	1.4E+09	1.3E+04	1		Nitropropane, 2-	79-46-9			1.4E-02	1.4E-02			2.7E+02	2.7E+02
2.7E+01	C	7.7E-03	C						M		1.4E+09		1	0.1	Nitroso-N-ethylurea, N-	759-73-9	5.7E-03	2.2E-02	1.8E+02	4.5E-03				
1.2E+02	C	3.4E-02	C						M		1.4E+09		1	0.1	Nitroso-N-methylurea, N-	684-93-5	1.3E-03	5.0E-03	4.1E+01	1.0E-03				
5.4E+00	I	1.6E-03	I					V			1.4E+09	2.4E+05	1		Nitroso-di-N-butylamine, N-	924-16-3	1.3E-01		4.3E-01	9.9E-02				
7.0E+00	I	2.0E-03	C								1.4E+09		1	0.1	Nitroso-di-N-propylamine, N-	621-64-7	9.9E-02	3.5E-01	1.9E+03	7.8E-02				
2.8E+00	I	8.0E-04	C								1.4E+09		1	0.1	Nitrosodiethanolamine, N-	1116-54-7	2.5E-01	8.8E-01	4.8E+03	1.9E-01				
1.5E+02	I	4.3E-02	I						M		1.4E+09		1	0.1	Nitrosodiethylamine, N-	55-18-5	1.0E-03	4.0E-03	3.2E+01	8.1E-04				
5.1E+01	I	1.4E-02	I	8.0E-06	P	4.0E-05	X	V	M	2.4E+05	1.4E+09	8.2E+04	1		Nitrosodimethylamine, N-	62-75-9	3.0E-03		6.0E-03	2.0E-03	6.3E-01		3.4E+00	5.3E-01
4.9E-03	I	2.6E-06	C								1.4E+09		1	0.1	Nitrosodiphenylamine, N-	86-30-6	1.4E+02	5.0E+02	1.5E+06	1.1E+02				
2.2E+01	I	6.3E-03	C					V		1.1E+05	1.4E+09	1.2E+05	1		Nitrosomethylethylamine, N-	10595-95-6	3.2E-02		5.4E-02	2.0E-02				
6.7E+00	C	1.9E-03	C								1.4E+09		1	0.1	Nitrosomorpholine [N-]	59-89-2	1.0E-01	3.7E-01	2.0E+03	8.1E-02				
9.4E+00	C	2.7E-03	C								1.4E+09		1	0.1	Nitrosopiperidine [N-]	100-75-4	7.4E-02	2.6E-01	1.4E+03	5.8E-02				
2.1E+00	I	6.1E-04	I								1.4E+09		1	0.1	Nitrosopyrrolidine, N-	930-55-2	3.3E-01	1.2E+00	6.3E+03	2.6E-01				
				1.0E-04	X						1.4E+09		1	0.1	Nitrotoluene, m-	99-08-1					7.8E+00	3.3E+01		6.3E+00
2.2E-01	P			9.0E-04	P			V		1.5E+03	1.4E+09	1.4E+05	1		Nitrotoluene, o-	88-72-2	3.2E+00			3.2E+00	7.0E+01			7.0E+01
1.6E-02	P			4.0E-03	P						1.4E+09		1	0.1	Nitrotoluene, p-	99-99-0	4.3E+01	1.5E+02		3.4E+01	3.1E+02	1.3E+03		2.5E+02
				3.0E-04	X	2.0E-02	P	V		6.9E+00	1.4E+09	1.0E+03	1		Nonane, n-	111-84-2					2.3E+01		2.2E+01	1.1E+01
				1.5E-02	O						1.4E+09		1	0.1	Norflurazon	27314-13-2					1.2E+03	4.9E+03		9.5E+02
				3.0E-03	I						1.4E+09		1	0.1	Octabromodiphenyl Ether	32536-52-0					2.3E+02	9.9E+02		1.9E+02
				5.0E-02	I						1.4E+09		1	0.006	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)	2691-41-0					3.9E+03	2.7E+05		3.9E+03
				2.0E-03	H						1.4E+09		1	0.1	Octamethylpyrophosphoramide	152-16-9					1.6E+02	6.6E+02		1.3E+02
7.8E-03	O			1.4E-01	O						1.4E+09		1	0.1	Oryzalin	19044-88-3	8.9E+01	3.2E+02		7.0E+01	1.1E+04	4.6E+04		8.8E+03
				5.0E-03	I						1.4E+09		1	0.1	Oxadiazon	19666-30-9					3.9E+02	1.6E+03		3.2E+02
				2.5E-02	I						1.4E+09		1	0.1	Oxamyl	23135-22-0					2.0E+03	8.2E+03		1.6E+03
7.3E-02	O			3.0E-02	O						1.4E+09		1	0.1	Oxyfluorfen	42874-03-3	9.5E+00	3.4E+01		7.4E+00	2.3E+03	9.9E+03		1.9E+03
				1.3E-02	I						1.4E+09		1	0.1	Paclobutrazol	76738-62-0					1.0E+03	4.3E+03		8.2E+02
				4.5E-03	I						1.4E+09		1	0.1	Paraquat Dichloride	1910-42-5					3.5E+02	1.5E+03		2.8E+02
				6.0E-03	H						1.4E+09		1	0.1	Parathion	56-38-2					4.7E+02	2.0E+03		3.8E+02
				5.0E-02	H			V			1.4E+09	4.5E+04	1		Pebulate	1114-71-2					3.9E+03			3.9E+03
				3.0E-02	O						1.4E+09		1	0.1	Pendimethalin	40487-42-1					2.3E+03	9.9E+03		1.9E+03
				2.0E-03	I			V		3.1E-01	1.4E+09	5.1E+05	1		Pentabromodiphenyl Ether	32534-81-9					1.6E+02			1.6E+02
				1.0E-04	I						1.4E+09		1	0.1	Pentabromodiphenyl ether, 2,2',4,4',5- (BDE-99)	60348-60-9					7.8E+00	3.3E+01		6.3E+00
				8.0E-04	I			V			1.4E+09	8.1E+04	1		Pentachlorobenzene	608-93-5					6.3E+01			6.3E+01
9.0E-02	P							V		4.6E+02	1.4E+09	9.6E+03	1		Pentachloroethane	76-01-7	7.7E+00			7.7E+00				
2.6E-01	H			3.0E-03	I			V			1.4E+09	4.3E+05	1		Pentachloronitrobenzene	82-68-8	2.7E+00			2.7E+00	2.3E+02			2.3E+02
4.0E-01	I	5.1E-06	C	5.0E-03	I						1.4E+09		1	0.25	Pentachlorophenol	87-86-5	1.7E+00	2.5E+00	7.5E+05	1.0E+00	3.9E+02	6.6E+02		2.5E+02
4.0E-03	X			2.0E-03	P						1.4E+09		1	0.1	Pentaerythritol tetranitrate (PETN)	78-11-5	1.7E+02	6.2E+02		1.4E+02	1.6E+02	6.6E+02		1.3E+02
						1.0E+00	P	V		3.9E+02	1.4E+09	7.8E+02	1		Pentane, n-	109-66-0							8.1E+02	8.1E+02
															Perchlorates									
				7.0E-04	I						1.4E+09		1		~Ammonium Perchlorate	7790-98-9					5.5E+01			5.5E+01
				7.0E-04	I						1.4E+09		1		~Lithium Perchlorate	7791-03-9					5.5E+01			5.5E+01
				7.0E-04	I						1.4E+09		1		~Perchlorate and Perchlorate Salts	14797-73-0					5.5E+01			5.5E+01
				7.0E-04	I						1.4E+09		1		~Potassium Perchlorate	7778-74-7					5.5E+01			5.5E+01
				7.0E-04	I						1.4E+09		1		~Sodium Perchlorate	7601-89-0					5.5E+01			5.5E+01
				2.0E-02	P						1.4E+09		1	0.1	Perfluorobutane sulfonic acid (PFBS)	375-73-5					1.6E+03	6.6E+03		1.3E+03
				2.0E-02	P						1.4E+09		1	0.1	Perfluorobutanesulfonate	45187-15-3					1.6E+03	6.6E+03		1.3E+03
				5.0E-02	I						1.4E+09		1	0.1	Permethrin	52645-53-1					3.9E+03	1.6E+04		3.2E+03
2.2E-03	C	6.3E-07	C								1.4E+09		1	0.1	Phenacetin	62-44-2	3.2E+02	1.1E+03	6.1E+06	2.5E+02				
				2.4E-01	O						1.4E+09		1	0.1	Phenmedipham	13684-63-4					1.9E+04	7.9E+04		1.5E+04
				3.0E-01	I	2.0E-01	C				1.4E+09		1	0.1	Phenol	108-95-2					2.3E+04	9.9E+04	2.8E+08	1.9E+04
				4.0E-03	I						1.4E+09		1	0.1	Phenol, 2-(1-methylethoxy)-, methylcarbamate	114-26-1					3.1E+02	1.3E+03		2.5E+02

Key: I = IRIS; P = PPRTV; D = DWSHA; O = OPP; A = ATSDR; C = Cal EPA; X = APPENDIX PPRTV SCREEN (See FAQ #29); H = HEAST; F = See FAQ; E = see user guide Section 2.3.5; W = see user guide Section 2.3.6; L = see user guide on lead; M = mutagen; S = see user guide Section 5; V = volatile; R = RBA applied (See User Guide for Arsenic notice) ; c = cancer; n = noncancer; * = where: n SL < 100X c SL; ** = where n SL < 10X c SL; SSL values are based on DAF=1; m = Concentration may exceed ceiling limit (See User Guide); s = Concentration may exceed Csat (See User Guide)

Toxicity and Chemical-specific Information														Contaminant		Carcinogenic Target Risk (TR) = 1E-06				Noncancer Child Hazard Index (HI) = 1			
SFO (mg/kg-day)$^{-1}$	key	IUR (ug/m^3)$^{-1}$	key	RfD_o (mg/kg-day)	key	RfC_i (mg/m^3)	key	vol	muta-gen	C_{sat} (mg/kg)	PEF (m^3/kg)	VF (m^3/kg)	GIABS	ABS	Analyte	CAS No.	Ingestion SL TR=1E-06 (mg/kg)	Dermal SL TR=1E-06 (mg/kg)	Inhalation SL TR=1E-06 (mg/kg)	Carcinogenic SL TR=1E-06 (mg/kg)	Ingestion SL Child THQ=1 (mg/kg)	Dermal SL Child THQ=1 (mg/kg)	Inhalation SL Child THQ=1 (mg/kg)	Noncarcinogenic SL Child THI=1 (mg/kg)
				5.0E-04	X						1.4E+09		1	0.1	Phenothiazine	92-84-2					3.9E+01	1.6E+02		3.2E+01
				2.0E-04	X			V		1.3E+02	1.4E+09	7.1E+03	1		Phenyl Isothiocyanate	103-72-0					1.6E+01			1.6E+01
				6.0E-03	I						1.4E+09		1	0.1	Phenylenediamine, m-	108-45-2					4.7E+02	2.0E+03		3.8E+02
1.2E-01	P			4.0E-03	P						1.4E+09		1	0.1	Phenylenediamine, o-	95-54-5	5.8E+00	2.1E+01		4.5E+00	3.1E+02	1.3E+03		2.5E+02
				1.0E-03	X						1.4E+09		1	0.1	Phenylenediamine, p-	106-50-3					7.8E+01	3.3E+02		6.3E+01
1.9E-03	H										1.4E+09		1	0.1	Phenylphenol, 2-	90-43-7	3.6E+02	1.3E+03		2.8E+02				
				2.0E-04	H						1.4E+09		1	0.1	Phorate	298-02-2					1.6E+01	6.6E+01		1.3E+01
						3.0E-04	I	V		1.6E+03	1.4E+09	9.8E+02	1		Phosgene	75-44-5							3.1E-01	3.1E-01
				2.0E-02	I						1.4E+09		1	0.1	Phosmet	732-11-6					1.6E+03	6.6E+03		1.3E+03
															Phosphates, Inorganic									
				4.9E+01	P						1.4E+09		1		~Aluminum metaphosphate	13776-88-0					3.8E+06			3.8E+06
				4.9E+01	P						1.4E+09		1		~Ammonium polyphosphate	68333-79-9					3.8E+06			3.8E+06
				4.9E+01	P						1.4E+09		1		~Calcium pyrophosphate	7790-76-3					3.8E+06			3.8E+06
				4.9E+01	P						1.4E+09		1		~Diammonium phosphate	7783-28-0					3.8E+06			3.8E+06
				4.9E+01	P						1.4E+09		1		~Dicalcium phosphate	7757-93-9					3.8E+06			3.8E+06
				4.9E+01	P						1.4E+09		1		~Dimagnesium phosphate	7782-75-4					3.8E+06			3.8E+06
				4.9E+01	P						1.4E+09		1		~Dipotassium phosphate	7758-11-4					3.8E+06			3.8E+06
				4.9E+01	P						1.4E+09		1		~Disodium phosphate	7558-79-4					3.8E+06			3.8E+06
				4.9E+01	P						1.4E+09		1		~Monoaluminum phosphate	13530-50-2					3.8E+06			3.8E+06
				4.9E+01	P						1.4E+09		1		~Monoammonium phosphate	7722-76-1					3.8E+06			3.8E+06
				4.9E+01	P						1.4E+09		1		~Monocalcium phosphate	7758-23-8					3.8E+06			3.8E+06
				4.9E+01	P						1.4E+09		1		~Monomagnesium phosphate	7757-86-0					3.8E+06			3.8E+06
				4.9E+01	P						1.4E+09		1		~Monopotassium phosphate	7778-77-0					3.8E+06			3.8E+06
				4.9E+01	P						1.4E+09		1		~Monosodium phosphate	7558-80-7					3.8E+06			3.8E+06
				4.9E+01	P						1.4E+09		1		~Polyphosphoric acid	8017-16-1					3.8E+06			3.8E+06
				4.9E+01	P						1.4E+09		1		~Potassium tripolyphosphate	13845-36-8					3.8E+06			3.8E+06
				4.9E+01	P						1.4E+09		1		~Sodium acid pyrophosphate	7758-16-9					3.8E+06			3.8E+06
				4.9E+01	P						1.4E+09		1		~Sodium aluminum phosphate (acidic)	7785-88-8					3.8E+06			3.8E+06
				4.9E+01	P						1.4E+09		1		~Sodium aluminum phosphate (anhydrous)	10279-59-1					3.8E+06			3.8E+06
				4.9E+01	P						1.4E+09		1		~Sodium aluminum phosphate (tetrahydrate)	10305-76-7					3.8E+06			3.8E+06
				4.9E+01	P						1.4E+09		1		~Sodium hexametaphosphate	10124-56-8					3.8E+06			3.8E+06
				4.9E+01	P						1.4E+09		1		~Sodium polyphosphate	68915-31-1					3.8E+06			3.8E+06
				4.9E+01	P						1.4E+09		1		~Sodium trimetaphosphate	7785-84-4					3.8E+06			3.8E+06
				4.9E+01	P						1.4E+09		1		~Sodium tripolyphosphate	7758-29-4					3.8E+06			3.8E+06
				4.9E+01	P						1.4E+09		1		~Tetrapotassium phosphate	7320-34-5					3.8E+06			3.8E+06
				4.9E+01	P						1.4E+09		1		~Tetrasodium pyrophosphate	7722-88-5					3.8E+06			3.8E+06
				4.9E+01	P						1.4E+09		1		~Trialuminum sodium tetra decahydrogenoctaorthophosphate (dihydrate)	15136-87-5					3.8E+06			3.8E+06
				4.9E+01	P						1.4E+09		1		~Tricalcium phosphate	7758-87-4					3.8E+06			3.8E+06
				4.9E+01	P						1.4E+09		1		~Trimagnesium phosphate	7757-87-1					3.8E+06			3.8E+06
				4.9E+01	P						1.4E+09		1		~Tripotassium phosphate	7778-53-2					3.8E+06			3.8E+06
				4.9E+01	P						1.4E+09		1		~Trisodium phosphate	7601-54-9					3.8E+06			3.8E+06
				3.0E-04	I	3.0E-04	I	V			1.4E+09		1		Phosphine	7803-51-2					2.3E+01		4.3E+05	2.3E+01
				4.9E+01	P	1.0E-02	I				1.4E+09		1		Phosphoric Acid	7664-38-2					3.8E+06		1.4E+07	3.0E+06
				2.0E-05	I			V			1.4E+09	6.9E+03	1		Phosphorus, White	7723-14-0					1.6E+00			1.6E+00
															Phthalates									
1.4E-02	I	2.4E-06	C	2.0E-02	I						1.4E+09		1	0.1	~Bis(2-ethylhexyl)phthalate	117-81-7	5.0E+01	1.8E+02	1.6E+06	3.9E+01	1.6E+03	6.6E+03		1.3E+03
1.9E-03	P			2.0E-01	I						1.4E+09		1	0.1	~Butyl Benzyl Phthalate	85-68-7	3.7E+02	1.3E+03		2.9E+02	1.6E+04	6.6E+04		1.3E+04
				1.0E+00	I						1.4E+09		1	0.1	~Butylphthalyl Butylglycolate	85-70-1					7.8E+04	3.3E+05		6.3E+04
				1.0E-01	I						1.4E+09		1	0.1	~Dibutyl Phthalate	84-74-2					7.8E+03	3.3E+04		6.3E+03
				8.0E-01	I						1.4E+09		1	0.1	~Diethyl Phthalate	84-66-2					6.3E+04	2.6E+05		5.1E+04
				1.0E-01	I			V			1.4E+09	2.1E+04	1		~Dimethylterephthalate	120-61-6					7.8E+03			7.8E+03
				1.0E-02	P						1.4E+09		1	0.1	~Octyl Phthalate, di-N-	117-84-0					7.8E+02	3.3E+03		6.3E+02
				1.0E+00	H						1.4E+09		1	0.1	~Phthalic Acid, P-	100-21-0					7.8E+04	3.3E+05		6.3E+04
				2.0E+00	I	2.0E-02	C				1.4E+09		1	0.1	~Phthalic Anhydride	85-44-9					1.6E+05	6.6E+05	2.8E+07	1.3E+05
				7.0E-02	I						1.4E+09		1	0.1	Picloram	1918-02-1					5.5E+03	2.3E+04		4.4E+03
				1.0E-04	X						1.4E+09		1	0.1	Picramic Acid (2-Amino-4,6-dinitrophenol)	96-91-3					7.8E+00	3.3E+01		6.3E+00
				9.0E-04	X						1.4E+09		1	0.1	Picric Acid (2,4,6-Trinitrophenol)	88-89-1					7.0E+01	3.0E+02		5.7E+01
				6.7E-05	O						1.4E+09		1	0.1	Pirimiphos, Methyl	29232-93-7					5.2E+00	2.2E+01		4.2E+00
3.0E+01	C	8.6E-03	C	7.0E-06	H						1.4E+09		1	0.1	Polybrominated Biphenyls	59536-65-1	2.3E-02	8.2E-02	4.4E+02	1.8E-02	5.5E-01	2.3E+00		4.4E-01
															Polychlorinated Biphenyls (PCBs)									
7.0E-02	S	2.0E-05	S	7.0E-05	I			V			1.4E+09	7.1E+05	1	0.14	~Aroclor 1016	12674-11-2	9.9E+00	2.5E+01	1.0E+02	6.7E+00	5.5E+00	1.6E+01		4.1E+00
2.0E+00	S	5.7E-04	S					V			1.4E+09	2.0E+05	1	0.14	~Aroclor 1221	11104-28-2	3.5E-01	8.8E-01	1.0E+00	2.0E-01				
2.0E+00	S	5.7E-04	S					V			1.4E+09	1.1E+05	1	0.14	~Aroclor 1232	11141-16-5	3.5E-01	8.8E-01	5.5E-01	1.7E-01				
2.0E+00	S	5.7E-04	S					V			1.4E+09	5.9E+05	1	0.14	~Aroclor 1242	53469-21-9	3.5E-01	8.8E-01	2.9E+00	2.3E-01				
2.0E+00	S	5.7E-04	S					V			1.4E+09	6.3E+05	1	0.14	~Aroclor 1248	12672-29-6	3.5E-01	8.8E-01	3.1E+00	2.3E-01				
2.0E+00	S	5.7E-04	S	2.0E-05	I			V			1.4E+09	8.4E+05	1	0.14	~Aroclor 1254	11097-69-1	3.5E-01	8.8E-01	4.1E+00	2.4E-01	1.6E+00	4.7E+00		1.2E+00
2.0E+00	S	5.7E-04	S					V			1.4E+09	1.3E+06	1	0.14	~Aroclor 1260	11096-82-5	3.5E-01	8.8E-01	6.5E+00	2.4E-01				
				6.0E-04	X			V			1.4E+09	9.8E+05	1	0.14	~Aroclor 5460	11126-42-4					4.7E+01	1.4E+02		3.5E+01
3.9E+00	E	1.1E-03	E	2.3E-05	E	1.3E-03	E	V			1.4E+09	2.4E+06	1	0.14	~Heptachlorobiphenyl, 2,3,3',4,4',5,5'- (PCB 189)	39635-31-9	1.8E-01	4.5E-01	6.0E+00	1.3E-01	1.8E+00	5.5E+00	3.4E+03	1.4E+00

Key: I = IRIS; P = PPRTV; D = DWSHA; O = OPP; A = ATSDR; C = Cal EPA; X = APPENDIX PPRTV SCREEN (See FAQ #29); H = HEAST; F = See FAQ; E = see user guide Section 2.3.5; W = see user guide Section 2.3.6; L = see user guide on lead; M = mutagen; S = see user guide Section 5; V = volatile; R = RBA applied (See User Guide for Arsenic notice) ; c = cancer; n = noncancer; * = where: n SL < 100X c SL; ** = where n SL < 10X c SL; SSL values are based on DAF=1; m = Concentration may exceed ceiling limit (See User Guide); s = Concentration may exceed Csat (See User Guide)

Toxicity and Chemical-specific Information														Contaminant		Carcinogenic Target Risk (TR) = 1E-06				Noncancer Child Hazard Index (HI) = 1			
SFO (mg/kg-day)$^{-1}$	key	IUR (ug/m^3)$^{-1}$	key	RfD_o (mg/kg-day)	key	RfC_i (mg/m^3)	key	vol	muta-gen	C_{sat} (mg/kg)	PEF (m^3/kg)	VF (m^3/kg)	GIABS	ABS	Analyte	CAS No.	Ingestion SL TR=1E-06 (mg/kg)	Dermal SL TR=1E-06 (mg/kg)	Inhalation SL TR=1E-06 (mg/kg)	Carcinogenic SL TR=1E-06 (mg/kg)	Ingestion SL Child THQ=1 (mg/kg)	Dermal SL Child THQ=1 (mg/kg)	Inhalation SL Child THQ=1 (mg/kg)	Noncarcinogenic SL Child THI=1 (mg/kg)
3.9E+00	E	1.1E-03	E	2.3E-05	E	1.3E-03	E	V			1.4E+09	1.6E+06	1	0.14	~Hexachlorobiphenyl, 2,3',4,4',5,5'- (PCB 167)	52663-72-6	1.8E-01	4.5E-01	3.9E+00	1.2E-01	1.8E+00	5.5E+00	2.2E+03	1.4E+00
3.9E+00	E	1.1E-03	E	2.3E-05	E	1.3E-03	E	V			1.4E+09	1.0E+06	1	0.14	~Hexachlorobiphenyl, 2,3,3',4,4',5'- (PCB 157)	69782-90-7	1.8E-01	4.5E-01	2.6E+00	1.2E-01	1.8E+00	5.5E+00	1.4E+03	1.4E+00
3.9E+00	E	1.1E-03	E	2.3E-05	E	1.3E-03	E	V			1.4E+09	1.1E+06	1	0.14	~Hexachlorobiphenyl, 2,3,3',4,4',5- (PCB 156)	38380-08-4	1.8E-01	4.5E-01	2.7E+00	1.2E-01	1.8E+00	5.5E+00	1.5E+03	1.4E+00
3.9E+03	E	1.1E+00	E	2.3E-08	E	1.3E-06	E	V			1.4E+09	1.6E+06	1	0.14	~Hexachlorobiphenyl, 3,3',4,4',5,5'- (PCB 169)	32774-16-6	1.8E-04	4.5E-04	3.9E-03	1.2E-04	1.8E-03	5.5E-03	2.2E+00	1.4E-03
3.9E+00	E	1.1E-03	E	2.3E-05	E	1.3E-03	E	V			1.4E+09	7.3E+05	1	0.14	~Pentachlorobiphenyl, 2',3,4,4',5- (PCB 123)	65510-44-3	1.8E-01	4.5E-01	1.8E+00	1.2E-01	1.8E+00	5.5E+00	1.0E+03	1.4E+00
3.9E+00	E	1.1E-03	E	2.3E-05	E	1.3E-03	E	V			1.4E+09	5.9E+05	1	0.14	~Pentachlorobiphenyl, 2,3',4,4',5- (PCB 118)	31508-00-6	1.8E-01	4.5E-01	1.5E+00	1.2E-01	1.8E+00	5.5E+00	8.2E+02	1.4E+00
3.9E+00	E	1.1E-03	E	2.3E-05	E	1.3E-03	E	V			1.4E+09	6.0E+05	1	0.14	~Pentachlorobiphenyl, 2,3,3',4,4'- (PCB 105)	32598-14-4	1.8E-01	4.5E-01	1.5E+00	1.2E-01	1.8E+00	5.5E+00	8.4E+02	1.4E+00
3.9E+00	E	1.1E-03	E	2.3E-05	E	1.3E-03	E	V			1.4E+09	1.1E+06	1	0.14	~Pentachlorobiphenyl, 2,3,4,4',5- (PCB 114)	74472-37-0	1.8E-01	4.5E-01	2.6E+00	1.2E-01	1.8E+00	5.5E+00	1.5E+03	1.4E+00
1.3E+04	E	3.8E+00	E	7.0E-09	E	4.0E-07	E	V			1.4E+09	7.3E+05	1	0.14	~Pentachlorobiphenyl, 3,3',4,4',5- (PCB 126)	57465-28-8	5.3E-05	1.4E-04	5.4E-04	3.6E-05	5.5E-04	1.6E-03	3.0E-01	4.1E-04
2.0E+00	I	5.7E-04	I					V			1.4E+09	5.3E+05	1	0.14	~Polychlorinated Biphenyls (high risk)	1336-36-3	3.5E-01	8.8E-01	2.6E+00	2.3E-01				
4.0E-01	I	1.0E-04	I					V					1	0.14	~Polychlorinated Biphenyls (low risk)	1336-36-3								
7.0E-02	I	2.0E-05	I					V					1	0.14	~Polychlorinated Biphenyls (lowest risk)	1336-36-3								
1.3E+01	E	3.8E-03	E	7.0E-06	E	4.0E-04	E				1.4E+09		1	0.14	~Tetrachlorobiphenyl, 3,3',4,4'- (PCB 77)	32598-13-3	5.3E-02	1.4E-01	1.0E+03	3.8E-02	5.5E-01	1.6E+00	5.7E+05	4.1E-01
3.9E+01	E	1.1E-02	E	2.3E-06	E	1.3E-04	E	V			1.4E+09	5.1E+05	1	0.14	~Tetrachlorobiphenyl, 3,4,4',5- (PCB 81)	70362-50-4	1.8E-02	4.5E-02	1.3E-01	1.2E-02	1.8E-01	5.5E-01	7.1E+01	1.4E-01
						6.0E-04	I				1.4E+09		1	0.1	Polymeric Methylene Diphenyl Diisocyanate (PMDI)	9016-87-9							8.5E+05	8.5E+05
															Polynuclear Aromatic Hydrocarbons (PAHs)									
				6.0E-02	I			V			1.4E+09	1.4E+05	1	0.13	~Acenaphthene	83-32-9					4.7E+03	1.5E+04		3.6E+03
				3.0E-01	I			V			1.4E+09	5.2E+05	1	0.13	~Anthracene	120-12-7					2.3E+04	7.6E+04		1.8E+04
1.0E-01	E	6.0E-05	E					V	M		1.4E+09	4.4E+06	1	0.13	~Benz[a]anthracene	56-55-3	1.5E+00	4.6E+00	7.4E+01	1.1E+00				
1.2E+00	C	1.1E-04	C								1.4E+09		1	0.13	~Benzo(j)fluoranthene	205-82-3	5.8E-01	1.6E+00	3.5E+04	4.2E-01				
1.0E+00	I	6.0E-04	I	3.0E-04	I	2.0E-06	I		M		1.4E+09		1	0.13	~Benzo[a]pyrene	50-32-8	1.5E-01	4.6E-01	2.3E+03	1.1E-01	2.3E+01	7.6E+01	2.8E+03	1.8E+01
1.0E-01	E	6.0E-05	E						M		1.4E+09		1	0.13	~Benzo[b]fluoranthene	205-99-2	1.5E+00	4.6E+00	2.3E+04	1.1E+00				
1.0E-02	E	6.0E-06	E						M		1.4E+09		1	0.13	~Benzo[k]fluoranthene	207-08-9	1.5E+01	4.6E+01	2.3E+05	1.1E+01				
				8.0E-02	I			V			1.4E+09	8.0E+04	1	0.13	~Chloronaphthalene, Beta-	91-58-7					6.3E+03	2.0E+04		4.8E+03
1.0E-03	E	6.0E-07	E						M		1.4E+09		1	0.13	~Chrysene	218-01-9	1.5E+02	4.6E+02	2.3E+06	1.1E+02				
1.0E+00	E	6.0E-04	E						M		1.4E+09		1	0.13	~Dibenz[a,h]anthracene	53-70-3	1.5E-01	4.6E-01	2.3E+03	1.1E-01				
1.2E+01	C	1.1E-03	C								1.4E+09		1	0.13	~Dibenzo(a,e)pyrene	192-65-4	5.8E-02	1.6E-01	3.5E+03	4.2E-02				
2.5E+02	C	7.1E-02	C						M		1.4E+09		1	0.13	~Dimethylbenz(a)anthracene, 7,12-	57-97-6	6.1E-04	1.8E-03	1.9E+01	4.6E-04				
				4.0E-02	I						1.4E+09		1	0.13	~Fluoranthene	206-44-0					3.1E+03	1.0E+04		2.4E+03
				4.0E-02	I			V			1.4E+09	2.8E+05	1	0.13	~Fluorene	86-73-7					3.1E+03	1.0E+04		2.4E+03
1.0E-01	E	6.0E-05	E						M		1.4E+09		1	0.13	~Indeno[1,2,3-cd]pyrene	193-39-5	1.5E+00	4.6E+00	2.3E+04	1.1E+00				
2.9E-02	P			7.0E-02	A			V		3.9E+02	1.4E+09	5.9E+04	1	0.13	~Methylnaphthalene, 1-	90-12-0	2.4E+01	6.6E+01		1.8E+01	5.5E+03	1.8E+04		4.2E+03
				4.0E-03	I			V			1.4E+09	5.8E+04	1	0.13	~Methylnaphthalene, 2-	91-57-6					3.1E+02	1.0E+03		2.4E+02
		3.4E-05	C	2.0E-02	I	3.0E-03	I	V			1.4E+09	4.6E+04	1	0.13	~Naphthalene	91-20-3			3.8E+00	3.8E+00	1.6E+03	5.1E+03	1.4E+02	1.3E+02
1.2E+00	C	1.1E-04	C								1.4E+09		1	0.13	~Nitropyrene, 4-	57835-92-4	5.8E-01	1.6E+00	3.5E+04	4.2E-01				
				3.0E-02	I			V			1.4E+09	2.4E+06	1	0.13	~Pyrene	129-00-0					2.3E+03	7.6E+03		1.8E+03
				2.0E-02	P						1.4E+09		1	0.1	Potassium Perfluorobutane Sulfonate	29420-49-3					1.6E+03	6.6E+03		1.3E+03
1.5E-01	I			9.0E-03	I						1.4E+09		1	0.1	Prochloraz	67747-09-5	4.6E+00	1.6E+01		3.6E+00	7.0E+02	3.0E+03		5.7E+02
				6.0E-03	H			V			1.4E+09	4.2E+05	1		Profluralin	26399-36-0					4.7E+02			4.7E+02
				1.5E-02	I						1.4E+09		1	0.1	Prometon	1610-18-0					1.2E+03	4.9E+03		9.5E+02
				4.0E-02	O						1.4E+09		1	0.1	Prometryn	7287-19-6					3.1E+03	1.3E+04		2.5E+03
				1.3E-02	I						1.4E+09		1	0.1	Propachlor	1918-16-7					1.0E+03	4.3E+03		8.2E+02
				5.0E-03	I						1.4E+09		1	0.1	Propanil	709-98-8					3.9E+02	1.6E+03		3.2E+02
3.3E-02	O			4.0E-02	O						1.4E+09		1	0.1	Propargite	2312-35-8	2.1E+01	7.6E+01		1.7E+01	3.1E+03	1.3E+04		2.5E+03
				2.0E-03	I			V		1.1E+05	1.4E+09	6.3E+04	1		Propargyl Alcohol	107-19-7					1.6E+02			1.6E+02
				2.0E-02	I						1.4E+09		1	0.1	Propazine	139-40-2					1.6E+03	6.6E+03		1.3E+03
				2.0E-02	I						1.4E+09		1	0.1	Propham	122-42-9					1.6E+03	6.6E+03		1.3E+03
				1.0E-01	O						1.4E+09		1	0.1	Propiconazole	60207-90-1					7.8E+03	3.3E+04		6.3E+03
						8.0E-03	I	V		3.3E+04	1.4E+09	8.9E+03	1		Propionaldehyde	123-38-6							7.5E+01	7.5E+01
				1.0E-01	X	1.0E+00	X	V		2.6E+02	1.4E+09	7.0E+03	1		Propyl benzene	103-65-1					7.8E+03		7.3E+03	3.8E+03
						3.0E+00	C	V		3.5E+02	1.4E+09	7.0E+02	1		Propylene	115-07-1							2.2E+03	2.2E+03
				2.0E+01	P						1.4E+09		1	0.1	Propylene Glycol	57-55-6					1.6E+06	6.6E+06		1.3E+06
						2.7E-04	A				1.4E+09		1	0.1	Propylene Glycol Dinitrate	6423-43-4							3.9E+05	3.9E+05
				7.0E-01	H	2.0E+00	I	V		1.1E+05	1.4E+09	7.8E+04	1		Propylene Glycol Monomethyl Ether	107-98-2					5.5E+04		1.6E+05	4.1E+04
2.4E-01	I	3.7E-06	I			3.0E-02	I	V		7.8E+04	1.4E+09	1.0E+04	1		Propylene Oxide	75-56-9	2.9E+00		7.8E+00	2.1E+00			3.2E+02	3.2E+02
				7.5E-02	I						1.4E+09		1	0.1	Propyzamide	23950-58-5					5.9E+03	2.5E+04		4.7E+03
				1.0E-03	I			V		5.3E+05	1.4E+09	5.5E+04	1		Pyridine	110-86-1					7.8E+01			7.8E+01
				5.0E-04	I						1.4E+09		1	0.1	Quinalphos	13593-03-8					3.9E+01	1.6E+02		3.2E+01
3.0E+00	I										1.4E+09		1	0.1	Quinoline	91-22-5	2.3E-01	8.2E-01		1.8E-01				
				9.0E-03	I						1.4E+09		1	0.1	Quizalofop-ethyl	76578-14-8					7.0E+02	3.0E+03		5.7E+02
						3.0E-02	A				1.4E+09		1		Refractory Ceramic Fibers	E715557							4.3E+07	4.3E+07
				3.0E-02	I						1.4E+09		1	0.1	Resmethrin	10453-86-8					2.3E+03	9.9E+03		1.9E+03
				5.0E-02	H			V			1.4E+09	4.6E+05	1		Ronnel	299-84-3					3.9E+03			3.9E+03
				4.0E-03	I						1.4E+09		1	0.1	Rotenone	83-79-4					3.1E+02	1.3E+03		2.5E+02
2.2E-01	C	6.3E-05	C						M		1.4E+09		1	0.1	Safrole	94-59-7	7.0E-01	2.7E+00	2.2E+04	5.5E-01				
				5.0E-03	I						1.4E+09		1		Selenious Acid	7783-00-8					3.9E+02			3.9E+02
				5.0E-03	I	2.0E-02	C				1.4E+09		1		Selenium	7782-49-2					3.9E+02		2.8E+07	3.9E+02
				5.0E-03	C	2.0E-02	C				1.4E+09		1		Selenium Sulfide	7446-34-6					3.9E+02		2.8E+07	3.9E+02
				1.4E-01	O						1.4E+09		1	0.1	Sethoxydim	74051-80-2					1.1E+04	4.6E+04		8.8E+03

Key: I = IRIS; P = PPRTV; D = DWSHA; O = OPP; A = ATSDR; C = Cal EPA; X = APPENDIX PPRTV SCREEN (See FAQ #29); H = HEAST; F = See FAQ; E = see user guide Section 2.3.5; W = see user guide Section 2.3.6; L = see user guide on lead; M = mutagen; S = see user guide Section 5; V = volatile; R = RBA applied (See User Guide for Arsenic notice) ; c = cancer; n = noncancer; * = where: n SL < 100X c SL; ** = where n SL < 10X c SL; SSL values are based on DAF=1; m = Concentration may exceed ceiling limit (See User Guide); s = Concentration may exceed Csat (See User Guide)

Toxicity and Chemical-specific Information														Contaminant		Carcinogenic Target Risk (TR) = 1E-06				Noncancer Child Hazard Index (HI) = 1			
SFO (mg/kg-day)$^{-1}$	key	IUR (ug/m^3)$^{-1}$	key	RfD_o (mg/kg-day)	key	RfC_i (mg/m^3)	key	vol	muta-gen	C_{sat} (mg/kg)	PEF (m^3/kg)	VF (m^3/kg)	GIABS	ABS	Analyte	CAS No.	Ingestion SL TR=1E-06 (mg/kg)	Dermal SL TR=1E-06 (mg/kg)	Inhalation SL TR=1E-06 (mg/kg)	Carcinogenic SL TR=1E-06 (mg/kg)	Ingestion SL Child THQ=1 (mg/kg)	Dermal SL Child THQ=1 (mg/kg)	Inhalation SL Child THQ=1 (mg/kg)	Noncarcinogenic SL Child THI=1 (mg/kg)
						3.0E-03	C				1.4E+09		1		Silica (crystalline, respirable)	7631-86-9							4.3E+06	4.3E+06
				5.0E-03	I						1.4E+09		0.04		Silver	7440-22-4					3.9E+02			3.9E+02
1.2E-01	H			5.0E-03	I						1.4E+09		1	0.1	Simazine	122-34-9	5.8E+00	2.1E+01		4.5E+00	3.9E+02	1.6E+03		3.2E+02
				1.3E-02	I						1.4E+09		1	0.1	Sodium Acifluorfen	62476-59-9					1.0E+03	4.3E+03		8.2E+02
				4.0E-03	I						1.4E+09		1		Sodium Azide	26628-22-8					3.1E+02			3.1E+02
2.7E-01	H			3.0E-02	I						1.4E+09		1	0.1	Sodium Diethyldithiocarbamate	148-18-5	2.6E+00	9.2E+00		2.0E+00	2.3E+03	9.9E+03		1.9E+03
				5.0E-02	A	1.3E-02	C				1.4E+09		1		Sodium Fluoride	7681-49-4					3.9E+03		1.8E+07	3.9E+03
				2.0E-05	I						1.4E+09		1	0.1	Sodium Fluoroacetate	62-74-8					1.6E+00	6.6E+00		1.3E+00
				1.0E-03	H						1.4E+09		1		Sodium Metavanadate	13718-26-8					7.8E+01			7.8E+01
				8.0E-04	P						1.4E+09		1		Sodium Tungstate	13472-45-2					6.3E+01			6.3E+01
				8.0E-04	P						1.4E+09		1		Sodium Tungstate Dihydrate	10213-10-2					6.3E+01			6.3E+01
2.4E-02	H			3.0E-02	I						1.4E+09		1	0.1	Stirofos (Tetrachlorovinphos)	961-11-5	2.9E+01	1.0E+02		2.3E+01	2.3E+03	9.9E+03		1.9E+03
				6.0E-01	I						1.4E+09		1		Strontium, Stable	7440-24-6					4.7E+04			4.7E+04
				3.0E-04	I						1.4E+09		1	0.1	Strychnine	57-24-9					2.3E+01	9.9E+01		1.9E+01
				2.0E-01	I	1.0E+00	I	V		8.7E+02	1.4E+09	9.3E+03	1		Styrene	100-42-5					1.6E+04		9.7E+03	6.0E+03
				3.0E-03	P						1.4E+09		1	0.1	Styrene-Acrylonitrile (SAN) Trimer						2.3E+02	9.9E+02		1.9E+02
				1.0E-03	P	2.0E-03	X				1.4E+09		1	0.1	Sulfolane	126-33-0					7.8E+01	3.3E+02	2.8E+06	6.3E+01
				8.0E-04	P						1.4E+09		1	0.1	Sulfonylbis(4-chlorobenzene), 1,1'-	80-07-9					6.3E+01	2.6E+02		5.1E+01
						1.0E-03	C	V			1.4E+09		1		Sulfur Trioxide	7446-11-9							1.4E+06	1.4E+06
						1.0E-03	C				1.4E+09		1		Sulfuric Acid	7664-93-9							1.4E+06	1.4E+06
2.5E-02	I	7.1E-06	I	5.0E-02	H						1.4E+09		1		Sulfurous acid, 2-chloroethyl 2-[4-(1,1-dimethylethyl)phenoxy]-1-methylethyl ester	140-57-8	2.8E+01	9.9E+01	5.4E+05	2.2E+01	3.9E+03	1.6E+04		3.2E+03
				3.0E-02	H						1.4E+09		1	0.1	TCMTB	21564-17-0					2.3E+03	9.9E+03		1.9E+03
				7.0E-02	I						1.4E+09		1	0.1	Tebuthiuron	34014-18-1					5.5E+03	2.3E+04		4.4E+03
				2.0E-02	H						1.4E+09		1	0.1	Temephos	3383-96-8					1.6E+03	6.6E+03		1.3E+03
				1.3E-02	I						1.4E+09		1	0.1	Terbacil	5902-51-2					1.0E+03	4.3E+03		8.2E+02
				2.5E-05	H			V		3.1E+01	1.4E+09	2.6E+05	1		Terbufos	13071-79-9					2.0E+00			2.0E+00
				1.0E-03	I						1.4E+09		1	0.1	Terbutryn	886-50-0					7.8E+01	3.3E+02		6.3E+01
				1.0E-04	I						1.4E+09		1	0.1	Tetrabromodiphenyl ether, 2,2',4,4'- (BDE-47)	5436-43-1					7.8E+00	3.3E+01		6.3E+00
				3.0E-04	I			V			1.4E+09	5.1E+04	1		Tetrachlorobenzene, 1,2,4,5-	95-94-3					2.3E+01			2.3E+01
2.6E-02	I	7.4E-06	I	3.0E-02	I			V		6.8E+02	1.4E+09	5.7E+03	1		Tetrachloroethane, 1,1,1,2-	630-20-6	2.7E+01		2.2E+00	2.0E+00	2.3E+03			2.3E+03
2.0E-01	I	5.8E-05	C	2.0E-02	I			V		1.9E+03	1.4E+09	1.5E+04	1		Tetrachloroethane, 1,1,2,2-	79-34-5	3.5E+00		7.3E-01	6.0E-01	1.6E+03			1.6E+03
2.1E-03	I	2.6E-07	I	6.0E-03	I	4.0E-02	I	V		1.7E+02	1.4E+09	2.3E+03	1		Tetrachloroethylene	127-18-4	3.3E+02		2.5E+01	2.4E+01	4.7E+02		9.8E+01	8.1E+01
				3.0E-02	I						1.4E+09		1	0.1	Tetrachlorophenol, 2,3,4,6-	58-90-2					2.3E+03	9.9E+03		1.9E+03
2.0E+01	H							V			1.4E+09	1.1E+05	1		Tetrachlorotoluene, p- alpha, alpha, alpha-	5216-25-1	3.5E-02			3.5E-02				
				5.0E-04	I						1.4E+09		1	0.1	Tetraethyl Dithiopyrophosphate	3689-24-5					3.9E+01	1.6E+02		3.2E+01
						8.0E+01	I	V		2.1E+03	1.4E+09	1.2E+03	1		Tetrafluoroethane, 1,1,1,2-	811-97-2							1.0E+05	1.0E+05
				2.0E-03	P						1.4E+09		1	0.0007	Tetryl (Trinitrophenylmethylnitramine)	479-45-8					1.6E+02	1.0E+05		1.6E+02
				2.0E-05	S						1.4E+09		1		Thallic Oxide	1314-32-5					1.6E+00			1.6E+00
				1.0E-05	X						1.4E+09		1		Thallium (I) Nitrate	10102-45-1					7.8E-01			7.8E-01
				1.0E-05	X						1.4E+09		1		Thallium (Soluble Salts)	7440-28-0					7.8E-01			7.8E-01
				1.0E-05	X			V			1.4E+09		1		Thallium Acetate	563-68-8					7.8E-01			7.8E-01
				2.0E-05	X			V			1.4E+09		1		Thallium Carbonate	6533-73-9					1.6E+00			1.6E+00
				1.0E-05	X						1.4E+09		1		Thallium Chloride	7791-12-0					7.8E-01			7.8E-01
				1.0E-05	S						1.4E+09		1		Thallium Selenite	12039-52-0					7.8E-01			7.8E-01
				2.0E-05	X						1.4E+09		1		Thallium Sulfate	7446-18-6					1.6E+00			1.6E+00
				4.3E-02	O						1.4E+09		1	0.1	Thifensulfuron-methyl	79277-27-3					3.4E+03	1.4E+04		2.7E+03
				1.0E-02	I						1.4E+09		1	0.1	Thiobencarb	28249-77-6					7.8E+02	3.3E+03		6.3E+02
				7.0E-02	X						1.4E+09		1	0.0075	Thiodiglycol	111-48-8					5.5E+03	3.1E+05		5.4E+03
				3.0E-04	H						1.4E+09		1	0.1	Thiofanox	39196-18-4					2.3E+01	9.9E+01		1.9E+01
1.2E-02	O			2.7E-02	O						1.4E+09		1	0.1	Thiophanate, Methyl	23564-05-8	6.0E+01	2.1E+02		4.7E+01	2.1E+03	8.8E+03		1.7E+03
				1.5E-02	O						1.4E+09		1	0.1	Thiram	137-26-8					1.2E+03	4.9E+03		9.5E+02
				6.0E-01	H						1.4E+09		1		Tin	7440-31-5					4.7E+04			4.7E+04
						1.0E-04	A	V			1.4E+09		1		Titanium Tetrachloride	7550-45-0							1.4E+05	1.4E+05
				8.0E-02	I	5.0E+00	I	V		8.2E+02	1.4E+09	4.3E+03	1		Toluene	108-88-3					6.3E+03		2.2E+04	4.9E+03
		1.1E-05	C			8.0E-06	C	V			1.4E+09	7.6E+05	1		Toluene-2,4-diisocyanate	584-84-9			1.9E+02	1.9E+02			6.4E+00	6.4E+00
1.8E-01	X			2.0E-04	X						1.4E+09		1	0.1	Toluene-2,5-diamine	95-70-5	3.9E+00	1.4E+01		3.0E+00	1.6E+01	6.6E+01		1.3E+01
		1.1E-05	C			8.0E-06	C	V		1.7E+03	1.4E+09	6.3E+05	1		Toluene-2,6-diisocyanate	91-08-7			1.6E+02	1.6E+02			5.3E+00	5.3E+00
				5.0E-03	P						1.4E+09		1	0.1	Toluic Acid, p-	99-94-5					3.9E+02	1.6E+03		3.2E+02
1.6E-02	P	5.1E-05	C								1.4E+09		1	0.1	Toluidine, o- (Methylaniline, 2-)	95-53-4	4.3E+01	1.5E+02	7.5E+04	3.4E+01				
3.0E-02	P			4.0E-03	X						1.4E+09		1	0.1	Toluidine, p-	106-49-0	2.3E+01	8.2E+01		1.8E+01	3.1E+02	1.3E+03		2.5E+02
				3.0E+00	P			V		3.4E-01	1.4E+09	1.4E+03	1		Total Petroleum Hydrocarbons (Aliphatic High)	E1790670					2.3E+05			2.3E+05
						6.0E-01	P	V		1.4E+02	1.4E+09	8.3E+02	1		Total Petroleum Hydrocarbons (Aliphatic Low)	E1790666							5.2E+02	5.2E+02
				1.0E-02	X	1.0E-01	P	V		6.9E+00	1.4E+09	1.0E+03	1		Total Petroleum Hydrocarbons (Aliphatic Medium)	E1790668					7.8E+02		1.1E+02	9.6E+01
				4.0E-02	P						1.4E+09		1	0.1	Total Petroleum Hydrocarbons (Aromatic High)	E1790676					3.1E+03	1.3E+04		2.5E+03
				4.0E-03	P	3.0E-02	P	V		1.8E+03	1.4E+09	3.5E+03	1		Total Petroleum Hydrocarbons (Aromatic Low)	E1790672					3.1E+02		1.1E+02	8.2E+01
				4.0E-03	P	3.0E-03	P	V			1.4E+09	5.2E+04	1		Total Petroleum Hydrocarbons (Aromatic Medium)	E1790674					3.1E+02		1.6E+02	1.1E+02
1.1E+00	I	3.2E-04	I								1.4E+09		1	0.1	Toxaphene	8001-35-2	6.3E-01	2.2E+00	1.2E+04	4.9E-01				
				7.5E-03	I						1.4E+09		1	0.1	Tralomethrin	66841-25-6					5.9E+02	2.5E+03		4.7E+02
				3.0E-04	A			V			1.4E+09	3.4E+03	1		Tri-n-butyltin	688-73-3					2.3E+01			2.3E+01

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Toxicity and Chemical-specific Information														Contaminant		Carcinogenic Target Risk (TR) = 1E-06				Noncancer Child Hazard Index (HI) = 1			
SFO (mg/kg-day)$^{-1}$	key	IUR (ug/m^3)$^{-1}$	key	RfD_o (mg/kg-day)	key	RfC_i (mg/m^3)	key	vol	muta-gen	C_{sat} (mg/kg)	PEF (m^3/kg)	VF (m^3/kg)	GIABS	ABS	Analyte	CAS No.	Ingestion SL TR=1E-06 (mg/kg)	Dermal SL TR=1E-06 (mg/kg)	Inhalation SL TR=1E-06 (mg/kg)	Carcinogenic SL TR=1E-06 (mg/kg)	Ingestion SL Child THQ=1 (mg/kg)	Dermal SL Child THQ=1 (mg/kg)	Inhalation SL Child THQ=1 (mg/kg)	Noncarcinogenic SL Child THI=1 (mg/kg)
				8.0E+01	X						1.4E+09		1	0.1	Triacetin	102-76-1					6.3E+06	2.6E+07		5.1E+06
				3.4E-02	O						1.4E+09		1	0.1	Triadimefon	43121-43-3					2.7E+03	1.1E+04		2.1E+03
7.2E-02	O			2.5E-02	O			V			1.4E+09	3.6E+05	1		Triallate	2303-17-5	9.7E+00			9.7E+00	2.0E+03			2.0E+03
				1.0E-02	I						1.4E+09		1	0.1	Triasulfuron	82097-50-5					7.8E+02	3.3E+03		6.3E+02
				8.0E-03	I						1.4E+09		1	0.1	Tribenuron-methyl	101200-48-0					6.3E+02	2.6E+03		5.1E+02
				5.0E-03	I			V			1.4E+09	4.8E+04	1		Tribromobenzene, 1,2,4-	615-54-3					3.9E+02			3.9E+02
				9.0E-03	X						1.4E+09		1	0.1	Tribromophenol, 2,4,6-	118-79-6					7.0E+02	3.0E+03		5.7E+02
9.0E-03	P			1.0E-02	P						1.4E+09		1	0.1	Tributyl Phosphate	126-73-8	7.7E+01	2.7E+02		6.0E+01	7.8E+02	3.3E+03		6.3E+02
				3.0E-04	P						1.4E+09		1	0.1	Tributyltin Compounds	E1790678					2.3E+01	9.9E+01		1.9E+01
				3.0E-04	I						1.4E+09		1	0.1	Tributyltin Oxide	56-35-9					2.3E+01	9.9E+01		1.9E+01
				3.0E+01	I	5.0E+00	P	V		9.1E+02	1.4E+09	1.3E+03	1		Trichloro-1,2,2-trifluoroethane, 1,1,2-	76-13-1					2.3E+06		6.7E+03	6.7E+03
7.0E-02	I			2.0E-02	I						1.4E+09		1	0.1	Trichloroacetic Acid	76-03-9	9.9E+00	3.5E+01		7.8E+00	1.6E+03	6.6E+03		1.3E+03
2.9E-02	H										1.4E+09		1	0.1	Trichloroaniline HCl, 2,4,6-	33663-50-2	2.4E+01	8.5E+01		1.9E+01				
7.0E-03	X			3.0E-05	X						1.4E+09		1	0.1	Trichloroaniline, 2,4,6-	634-93-5	9.9E+01	3.5E+02		7.8E+01	2.3E+00	9.9E+00		1.9E+00
				8.0E-04	X			V			1.4E+09	3.2E+04	1		Trichlorobenzene, 1,2,3-	87-61-6					6.3E+01			6.3E+01
2.9E-02	P			1.0E-02	I	2.0E-03	P	V		4.0E+02	1.4E+09	3.0E+04	1		Trichlorobenzene, 1,2,4-	120-82-1	2.4E+01			2.4E+01	7.8E+02		6.2E+01	5.8E+01
				2.0E+00	I	5.0E+00	I	V		6.4E+02	1.4E+09	1.6E+03	1		Trichloroethane, 1,1,1-	71-55-6					1.6E+05		8.6E+03	8.1E+03
5.7E-02	I	1.6E-05	I	4.0E-03	I	2.0E-04	X	V		2.2E+03	1.4E+09	7.2E+03	1		Trichloroethane, 1,1,2-	79-00-5	1.2E+01		1.3E+00	1.1E+00	3.1E+02		1.5E+00	1.5E+00
4.6E-02	I	4.1E-06	I	5.0E-04	I	2.0E-03	I	V	M	6.9E+02	1.4E+09	2.2E+03	1		Trichloroethylene	79-01-6	8.8E+00		1.1E+00	9.4E-01	3.9E+01		4.6E+00	4.1E+00
				3.0E-01	I			V		1.2E+03	1.4E+09	1.0E+03	1		Trichlorofluoromethane	75-69-4					2.3E+04			2.3E+04
				1.0E-01	I						1.4E+09		1	0.1	Trichlorophenol, 2,4,5-	95-95-4					7.8E+03	3.3E+04		6.3E+03
1.1E-02	I	3.1E-06	I	1.0E-03	P						1.4E+09		1	0.1	Trichlorophenol, 2,4,6-	88-06-2	6.3E+01	2.2E+02	1.2E+06	4.9E+01	7.8E+01	3.3E+02		6.3E+01
				1.0E-02	I						1.4E+09		1	0.1	Trichlorophenoxyacetic Acid, 2,4,5-	93-76-5					7.8E+02	3.3E+03		6.3E+02
				8.0E-03	I						1.4E+09		1	0.1	Trichlorophenoxypropionic acid, -2,4,5	93-72-1					6.3E+02	2.6E+03		5.1E+02
				5.0E-03	I			V		1.3E+03	1.4E+09	1.5E+04	1		Trichloropropane, 1,1,2-	598-77-6					3.9E+02			3.9E+02
3.0E+01	I			4.0E-03	I	3.0E-04	I	V	M	1.4E+03	1.4E+09	1.6E+04	1		Trichloropropane, 1,2,3-	96-18-4	5.1E-03			5.1E-03	3.1E+02		4.9E+00	4.8E+00
				3.0E-03	X	3.0E-04	P	V		3.1E+02	1.4E+09	2.3E+03	1		Trichloropropene, 1,2,3-	96-19-5					2.3E+02		7.3E-01	7.3E-01
				2.0E-02	A						1.4E+09		1	0.1	Tricresyl Phosphate (TCP)	1330-78-5					1.6E+03	6.6E+03		1.3E+03
				3.0E-03	I						1.4E+09		1	0.1	Tridiphane	58138-08-2					2.3E+02	9.9E+02		1.9E+02
						7.0E-03	I	V		2.8E+04	1.4E+09	1.6E+04	1		Triethylamine	121-44-8							1.2E+02	1.2E+02
				2.0E+00	P						1.4E+09		1	0.1	Triethylene Glycol	112-27-6					1.6E+05	6.6E+05		1.3E+05
						2.0E+01	P	V		4.8E+03	1.4E+09	7.1E+02	1		Trifluoroethane, 1,1,1-	420-46-2							1.5E+04	1.5E+04
7.7E-03	I			7.5E-03	I			V			1.4E+09	5.1E+05	1		Trifluralin	1582-09-8	9.0E+01			9.0E+01	5.9E+02			5.9E+02
2.0E-02	P			1.0E-02	P						1.4E+09		1	0.1	Trimethyl Phosphate	512-56-1	3.5E+01	1.2E+02		2.7E+01	7.8E+02	3.3E+03		6.3E+02
				1.0E-02	I	6.0E-02	I	V		2.9E+02	1.4E+09	9.4E+03	1		Trimethylbenzene, 1,2,3-	526-73-8					7.8E+02		5.9E+02	3.4E+02
				1.0E-02	I	6.0E-02	I	V		2.2E+02	1.4E+09	7.9E+03	1		Trimethylbenzene, 1,2,4-	95-63-6					7.8E+02		5.0E+02	3.0E+02
				1.0E-02	I	6.0E-02	I	V		1.8E+02	1.4E+09	6.6E+03	1		Trimethylbenzene, 1,3,5-	108-67-8					7.8E+02		4.1E+02	2.7E+02
				1.0E-02	X			V		3.0E+01	1.4E+09	1.0E+03	1		Trimethylpentene, 2,4,4-	25167-70-8					7.8E+02			7.8E+02
				3.0E-02	I						1.4E+09		1	0.019	Trinitrobenzene, 1,3,5-	99-35-4					2.3E+03	5.2E+04		2.2E+03
3.0E-02	I			5.0E-04	I						1.4E+09		1	0.032	Trinitrotoluene, 2,4,6-	118-96-7	2.3E+01	2.6E+02		2.1E+01	3.9E+01	5.2E+02		3.6E+01
				2.0E-02	P						1.4E+09		1	0.1	Triphenylphosphine Oxide	791-28-6					1.6E+03	6.6E+03		1.3E+03
				2.0E-02	A						1.4E+09		1	0.1	Tris(1,3-Dichloro-2-propyl) Phosphate	13674-87-8					1.6E+03	6.6E+03		1.3E+03
				1.0E-02	X						1.4E+09		1	0.1	Tris(1-chloro-2-propyl)phosphate	13674-84-5					7.8E+02	3.3E+03		6.3E+02
2.3E+00	C	6.6E-04	C					V		4.7E+02	1.4E+09	9.0E+05	1		Tris(2,3-dibromopropyl)phosphate	126-72-7	3.0E-01		3.8E+00	2.8E-01				
2.0E-02	P			7.0E-03	P						1.4E+09		1	0.1	Tris(2-chloroethyl)phosphate	115-96-8	3.5E+01	1.2E+02		2.7E+01	5.5E+02	2.3E+03		4.4E+02
3.2E-03	P			1.0E-01	P						1.4E+09		1	0.1	Tris(2-ethylhexyl)phosphate	78-42-2	2.2E+02	7.7E+02		1.7E+02	7.8E+03	3.3E+04		6.3E+03
				8.0E-04	P						1.4E+09		1		Tungsten	7440-33-7					6.3E+01			6.3E+01
				2.0E-04	A	4.0E-05	A				1.4E+09		1		Uranium (Soluble Salts)	E715565					1.6E+01		5.7E+04	1.6E+01
1.0E+00	C	2.9E-04	C						M		1.4E+09		1	0.1	Urethane	51-79-6	1.5E-01	6.0E-01	4.8E+03	1.2E-01				
		8.3E-03	P	9.0E-03	I	7.0E-06	P				1.4E+09		0.026		Vanadium Pentoxide	1314-62-1			4.6E+02	4.6E+02	7.0E+02		9.9E+03	6.6E+02
				5.0E-03	S	1.0E-04	A				1.4E+09		0.026		Vanadium and Compounds	7440-62-2					3.9E+02		1.4E+05	3.9E+02
				1.0E-03	I			V			1.4E+09	1.2E+05	1		Vernolate	1929-77-7					7.8E+01			7.8E+01
				1.2E-03	O						1.4E+09		1	0.1	Vinclozolin	50471-44-8					9.4E+01	4.0E+02		7.6E+01
				1.0E+00	H	2.0E-01	I	V		2.8E+03	1.4E+09	4.4E+03	1		Vinyl Acetate	108-05-4					7.8E+04		9.2E+02	9.1E+02
		3.2E-05	H			3.0E-03	I	V		2.5E+03	1.4E+09	1.4E+03	1		Vinyl Bromide	593-60-2			1.2E-01	1.2E-01			4.3E+00	4.3E+00
7.2E-01	I	4.4E-06	I	3.0E-03	I	1.0E-01	I	V	M	3.9E+03	1.4E+09	9.6E+02	1		Vinyl Chloride	75-01-4	9.4E-02		1.6E-01	5.9E-02	2.3E+02		1.0E+02	7.0E+01
				3.0E-04	I						1.4E+09		1	0.1	Warfarin	81-81-2					2.3E+01	9.9E+01		1.9E+01
				2.0E-01	S	1.0E-01	S	V		3.9E+02	1.4E+09	5.6E+03	1		Xylene, P-	106-42-3					1.6E+04		5.8E+02	5.6E+02
				2.0E-01	S	1.0E-01	S	V		3.9E+02	1.4E+09	5.5E+03	1		Xylene, m-	108-38-3					1.6E+04		5.7E+02	5.5E+02
				2.0E-01	S	1.0E-01	S	V		4.3E+02	1.4E+09	6.5E+03	1		Xylene, o-	95-47-6					1.6E+04		6.7E+02	6.5E+02
				2.0E-01	I	1.0E-01	I	V		2.6E+02	1.4E+09	5.7E+03	1		Xylenes	1330-20-7					1.6E+04		6.0E+02	5.8E+02
				3.0E-04	I						1.4E+09		1		Zinc Phosphide	1314-84-7					2.3E+01			2.3E+01
				3.0E-01	I						1.4E+09		1		Zinc and Compounds	7440-66-6					2.3E+04			2.3E+04
				5.0E-02	I						1.4E+09		1	0.1	Zineb	12122-67-7					3.9E+03	1.6E+04		3.2E+03
				8.0E-05	X						1.4E+09		1		Zirconium	7440-67-7					6.3E+00			6.3E+00

Key: I = IRIS; P = PPRTV; D = DWSHA; O = OPP; A = ATSDR; C = Cal EPA; X = APPENDIX PPRTV SCREEN (See FAQ #29); H = HEAST; F = See FAQ; E = see user guide Section 2.3.5; W = see user guide Section 2.3.6; L = see user guide on lead; M = mutagen; S = see user guide Section 5; V = volatile; R = RBA applied (See User Guide for Arsenic notice) ; c = cancer; n = noncancer; * = where: n SL < 100X c SL; ** = where n SL < 10X c SL; SSL values are based on DAF=1; m = Concentration may exceed ceiling limit (See User Guide); s = Concentration may exceed Csat (See User Guide)

Toxicity and Chemical-specific Information														Contaminant		Carcinogenic Target Risk (TR) = 1E-06				Noncancer Hazard Index (HI) = 1			
SFO $(mg/kg\text{-}day)^{-1}$	key	IUR $(ug/m^3)^{-1}$	key	RfD_o (mg/kg-day)	key	RfC_i (mg/m^3)	key	vol	muta-gen	C_{sat} (mg/kg)	PEF $(m^3/kg\text{-}day)$	VF (m^3/kg)	GIABS	ABS	Analyte	CAS No.	Ingestion SL TR=1E-06 (mg/kg)	Dermal SL TR=1E-06 (mg/kg)	Inhalation SL TR=1E-06 (mg/kg)	Carcinogenic SL TR=1E-06 (mg/kg)	Ingestion SL THQ=1 (mg/kg)	Dermal SL THQ=1 (mg/kg)	Inhalation SL THQ=1 (mg/kg)	Noncarcinogenic SL THI=1 (mg/kg)
				1.2E-03	O						1.4E+09		1	0.1	Acephate	30560-19-1					1.4E+03	3.3E+03		9.8E+02
		2.2E-06	I			9.0E-03	I	V		1.1E+05	1.4E+09	8.7E+03	1		Acetaldehyde	75-07-0			4.9E+01	4.9E+01			3.4E+02	3.4E+02
				2.0E-02	I						1.4E+09		1	0.1	Acetochlor	34256-82-1					2.3E+04	5.5E+04		1.6E+04
				9.0E-01	I	3.1E+01	A	V		1.1E+05	1.4E+09	1.4E+04	1		Acetone	67-64-1					1.1E+06		1.8E+06	6.7E+05
				2.0E-03	X						1.4E+09		1	0.1	Acetone Cyanohydrin	75-86-5							1.2E+07	1.2E+07
				6.0E-02	I	V				1.3E+05	1.4E+09	1.3E+04	1		Acetonitrile	75-05-8							3.4E+03	3.4E+03
				1.0E-01	I			V		2.5E+03	1.4E+09	6.0E+04	1		Acetophenone	98-86-2					1.2E+05			1.2E+05
3.8E+00	C	1.3E-03	C								1.4E+09		1	0.1	Acetylaminofluorene, 2-	53-96-3	8.6E-01	2.0E+00	1.3E+04	6.0E-01				
				5.0E-04	I	2.0E-05	I	V		2.3E+04	1.4E+09	6.9E+03	1		Acrolein	107-02-8					5.8E+02		6.1E-01	6.0E-01
5.0E-01	I	1.0E-04	I	2.0E-03	I	6.0E-03	I		M		1.4E+09		1	0.1	Acrylamide	79-06-1	6.5E+00	1.5E+01	1.7E+05	4.6E+00	2.3E+03	5.5E+03	3.6E+07	1.6E+03
				5.0E-01	I	1.0E-03	I	V		1.1E+05	1.4E+09	9.5E+04	1		Acrylic Acid	79-10-7					5.8E+05		4.2E+02	4.2E+02
5.4E-01	I	6.8E-05	I	4.0E-02	A	2.0E-03	I	V		1.1E+04	1.4E+09	7.7E+03	1		Acrylonitrile	107-13-1	6.1E+00		1.4E+00	1.1E+00	4.7E+04		6.7E+01	6.7E+01
				6.0E-03	P						1.4E+09		1	0.1	Adiponitrile	111-69-3							3.6E+07	3.6E+07
5.6E-02	C			1.0E-02	I						1.4E+09		1	0.1	Alachlor	15972-60-8	5.8E+01	1.4E+02		4.1E+01	1.2E+04	2.8E+04		8.2E+03
				1.0E-03	I						1.4E+09		1	0.1	Aldicarb	116-06-3					1.2E+03	2.8E+03		8.2E+02
				1.0E-03	I						1.4E+09		1	0.1	Aldicarb Sulfone	1646-88-4					1.2E+03	2.8E+03		8.2E+02
											1.4E+09		1	0.1	Aldicarb sulfoxide	1646-87-3								
1.7E+01	I	4.9E-03	I	3.0E-05	I			V			1.4E+09	1.7E+06	1		Aldrin	309-00-2	1.9E-01		4.3E+00	1.8E-01	3.5E+01			3.5E+01
				5.0E-03	I	1.0E-04	X	V		1.1E+05	1.4E+09	3.4E+04	1		Allyl Alcohol	107-18-6					5.8E+03		1.5E+01	1.5E+01
2.1E-02	C	6.0E-06	C			1.0E-03	I	V		1.4E+03	1.4E+09	1.6E+03	1		Allyl Chloride	107-05-1	1.6E+02		3.2E+00	3.2E+00			6.9E+00	6.9E+00
				1.0E+00	P	5.0E-03	P				1.4E+09		1		Aluminum	7429-90-5					1.2E+06		3.0E+07	1.1E+06
				4.0E-04	I						1.4E+09		1		Aluminum Phosphide	20859-73-8					4.7E+02			4.7E+02
				9.0E-03	I						1.4E+09		1	0.1	Ametryn	834-12-8					1.1E+04	2.5E+04		7.4E+03
2.1E+01	C	6.0E-03	C								1.4E+09		1	0.1	Aminobiphenyl, 4-	92-67-1	1.6E-01	3.7E-01	2.8E+03	1.1E-01				
				8.0E-02	P						1.4E+09		1	0.1	Aminophenol, m-	591-27-5					9.3E+04	2.2E+05		6.6E+04
				4.0E-03	X						1.4E+09		1	0.1	Aminophenol, o-	95-55-6					4.7E+03	1.1E+04		3.3E+03
				2.0E-02	P						1.4E+09		1	0.1	Aminophenol, p-	123-30-8					2.3E+04	5.5E+04		1.6E+04
				2.5E-03	I						1.4E+09		1	0.1	Amitraz	33089-61-1					2.9E+03	6.9E+03		2.1E+03
						5.0E-01	I	V					1		Ammonia	7664-41-7								
				2.0E-01	I						1.4E+09		1		Ammonium Sulfamate	7773-06-0					2.3E+05			2.3E+05
						3.0E-03	X	V		1.4E+04	1.4E+09	2.6E+04	1		Amyl Alcohol, tert-	75-85-4							3.4E+02	3.4E+02
5.7E-03	I	1.6E-06	C	7.0E-03	P	1.0E-03	I				1.4E+09		1	0.1	Aniline	62-53-3	5.7E+02	1.4E+03	1.0E+07	4.0E+02	8.2E+03	1.9E+04	6.0E+06	5.7E+03
4.0E-02	P			2.0E-03	X						1.4E+09		1	0.1	Anthraquinone, 9,10-	84-65-1	8.2E+01	1.9E+02		5.7E+01	2.3E+03	5.5E+03		1.6E+03
				4.0E-04	I						1.4E+09		0.15		Antimony (metallic)	7440-36-0					4.7E+02			4.7E+02
				5.0E-04	H						1.4E+09		0.15		Antimony Pentoxide	1314-60-9					5.8E+02			5.8E+02
				4.0E-04	H						1.4E+09		0.15		Antimony Tetroxide	1332-81-6					4.7E+02			4.7E+02
						2.0E-04	I				1.4E+09		0.15		Antimony Trioxide	1309-64-4							1.2E+06	1.2E+06
1.5E+00	I	4.3E-03	I	3.0E-04	I	1.5E-05	C				1.4E+09		1	0.03	Arsenic, Inorganic	7440-38-2	3.6E+00	1.7E+01	3.9E+03	3.0E+00	5.8E+02	2.8E+03	8.9E+04	4.8E+02
				3.5E-06	C	5.0E-05	I				1.4E+09		1		Arsine	7784-42-1					4.1E+00		3.0E+05	4.1E+00
				3.6E-02	O						1.4E+09		1	0.1	Asulam	3337-71-1					4.2E+04	9.9E+04		3.0E+04
2.3E-01	C			3.5E-02	I						1.4E+09		1	0.1	Atrazine	1912-24-9	1.4E+01	3.4E+01		1.0E+01	4.1E+04	9.7E+04		2.9E+04
8.8E-01	C	2.5E-04	C								1.4E+09		1	0.1	Auramine	492-80-8	3.7E+00	8.8E+00	6.7E+04	2.6E+00				
				4.0E-04	I						1.4E+09		1	0.1	Avermectin B1	65195-55-3					4.7E+02	1.1E+03		3.3E+02
				3.0E-03	A	1.0E-02	A				1.4E+09		1	0.1	Azinphos-methyl	86-50-0					3.5E+03	8.3E+03	6.0E+07	2.5E+03
1.1E-01	I	3.1E-05	I					V			1.4E+09	5.2E+05	1		Azobenzene	103-33-3	3.0E+01		2.1E+02	2.6E+01				
				1.0E+00	P	7.0E-06	P				1.4E+09		1	0.1	Azodicarbonamide	123-77-3					1.2E+06	2.8E+06	4.2E+04	4.0E+04
				2.0E-01	I	5.0E-04	H				1.4E+09		0.07		Barium	7440-39-3					2.3E+05		3.0E+06	2.2E+05
				5.0E-03	O			V			1.4E+09	3.1E+05	1		Benfluralin	1861-40-1					5.8E+03			5.8E+03
				5.0E-02	I						1.4E+09		1	0.1	Benomyl	17804-35-2					5.8E+04	1.4E+05		4.1E+04
				2.0E-01	I						1.4E+09		1	0.1	Bensulfuron-methyl	83055-99-6					2.3E+05	5.5E+05		1.6E+05
				3.0E-02	I						1.4E+09		1	0.1	Bentazon	25057-89-0					3.5E+04	8.3E+04		2.5E+04
4.0E-03	P			1.0E-01	I			V		1.2E+03	1.4E+09	2.2E+04	1		Benzaldehyde	100-52-7	8.2E+02			8.2E+02	1.2E+05			1.2E+05
5.5E-02	I	7.8E-06	I	4.0E-03	I	3.0E-02	I	V		1.8E+03	1.4E+09	3.5E+03	1		Benzene	71-43-2	5.9E+01		5.6E+00	5.1E+00	4.7E+03		4.6E+02	4.2E+02
1.0E-01	X			3.0E-04	X						1.4E+09		1	0.1	Benzenediamine-2-methyl sulfate, 1,4-	6369-59-1	3.3E+01	7.7E+01		2.3E+01	3.5E+02	8.3E+02		2.5E+02
				1.0E-03	P			V		1.3E+03	1.4E+09	1.9E+04	1		Benzenethiol	108-98-5					1.2E+03			1.2E+03
2.3E+02	I	6.7E-02	I	3.0E-03	I				M		1.4E+09		1	0.1	Benzidine	92-87-5	1.4E-02	3.4E-02	2.5E+02	1.0E-02	3.5E+03	8.3E+03		2.5E+03
				4.0E+00	I						1.4E+09		1	0.1	Benzoic Acid	65-85-0					4.7E+06	1.1E+07		3.3E+06
1.3E+01	I							V		3.2E+02	1.4E+09	6.8E+04	1		Benzotrichloride	98-07-7	2.5E-01			2.5E-01				
				1.0E-01	P						1.4E+09		1	0.1	Benzyl Alcohol	100-51-6					1.2E+05	2.8E+05		8.2E+04
1.7E-01	I	4.9E-05	C	2.0E-03	P	1.0E-03	P	V		1.5E+03	1.4E+09	2.5E+04	1		Benzyl Chloride	100-44-7	1.9E+01		6.4E+00	4.8E+00	2.3E+03		1.1E+02	1.1E+02
		2.4E-03	I	2.0E-03	I	2.0E-05	I				1.4E+09		0.007		Beryllium and compounds	7440-41-7			6.9E+03	6.9E+03	2.3E+03		1.2E+05	2.3E+03
				9.0E-03	P						1.4E+09		1	0.1	Bifenox	42576-02-3					1.1E+04	2.5E+04		7.4E+03
				1.5E-02	I						1.4E+09		1	0.1	Biphenthrin	82657-04-3					1.8E+04	4.1E+04		1.2E+04
8.0E-03	I			5.0E-01	I	4.0E-04	X	V			1.4E+09	1.1E+05	1		Biphenyl, 1,1'-	92-52-4	4.1E+02			4.1E+02	5.8E+05		2.0E+02	2.0E+02
				4.0E-02	I			V		1.0E+03	1.4E+09	3.5E+04	1		Bis(2-chloro-1-methylethyl) ether	108-60-1					4.7E+04			4.7E+04
				3.0E-03	P						1.4E+09		1	0.1	Bis(2-chloroethoxy)methane	111-91-1					3.5E+03	8.3E+03		2.5E+03
1.1E+00	I	3.3E-04	I					V		5.1E+03	1.4E+09	4.3E+04	1		Bis(2-chloroethyl)ether	111-44-4	3.0E+00		1.6E+00	1.0E+00				
2.2E+02	I	6.2E-02	I					V		4.2E+03	1.4E+09	1.9E+03	1		Bis(chloromethyl)ether	542-88-1	1.5E-02		3.7E-04	3.6E-04				
				5.0E-02	I						1.4E+09		1	0.1	Bisphenol A	80-05-7					5.8E+04	1.4E+05		4.1E+04
				2.0E-01	I	2.0E-02	H				1.4E+09		1		Boron And Borates Only	7440-42-8					2.3E+05		1.2E+08	2.3E+05

Key: I = IRIS; P = PPRTV; D = DWSHA; O = OPP; A = ATSDR; C = Cal EPA; X = APPENDIX PPRTV SCREEN (See FAQ #29); H = HEAST; F = See FAQ; E = see user guide Section 2.3.5; W = see user guide Section 2.3.6; L = see user guide on lead; M = mutagen; S = see user guide Section 5; V = volatile; R = RBA applied (See User Guide for Arsenic notice) ; c = cancer; n = noncancer; * = where: n SL < 100X c SL; ** = where n SL < 10X c SL; SSL values are based on DAF=1; m = Concentration may exceed ceiling limit (See User Guide); s = Concentration may exceed Csat (See User Guide)

Toxicity and Chemical-specific Information														Contaminant		Carcinogenic Target Risk (TR) = 1E-06				Noncancer Hazard Index (HI) = 1			
SFO (mg/kg-day)$^{-1}$	key	IUR (ug/m^3)$^{-1}$	key	RfD_o (mg/kg-day)	key	RfC_i (mg/m^3)	key	vol	muta-gen	C_{sat} (mg/kg)	PEF (m^3/kg)	VF (m^3/kg)	GIABS	ABS	Analyte	CAS No.	Ingestion SL TR=1E-06 (mg/kg)	Dermal SL TR=1E-06 (mg/kg)	Inhalation SL TR=1E-06 (mg/kg)	Carcinogenic SL TR=1E-06 (mg/kg)	Ingestion SL THQ=1 (mg/kg)	Dermal SL THQ=1 (mg/kg)	Inhalation SL THQ=1 (mg/kg)	Noncarcinogenic SL THI=1 (mg/kg)
				2.0E+00	P	2.0E-02	P	V			1.4E+09		1		Boron Trichloride	10294-34-5					2.3E+06		1.2E+08	2.3E+06
				4.0E-02	C	1.3E-02	C	V			1.4E+09		1		Boron Trifluoride	7637-07-2					4.7E+04		7.7E+07	4.7E+04
7.0E-01	I			4.0E-03	I						1.4E+09		1		Bromate	15541-45-4	4.7E+00			4.7E+00	4.7E+03			4.7E+03
2.0E+00	X	6.0E-04	X					V		2.4E+03	1.4E+09	5.9E+03	1		Bromo-2-chloroethane, 1-	107-04-0	1.6E+00		1.2E-01	1.1E-01				
				3.0E-04	X			V		9.0E+02	1.4E+09	1.1E+04	1		Bromo-3-fluorobenzene, 1-	1073-06-9					3.5E+02			3.5E+02
				3.0E-04	X			V		3.2E+02	1.4E+09	1.1E+04	1		Bromo-4-fluorobenzene, 1-	460-00-4					3.5E+02			3.5E+02
				8.0E-03	I	6.0E-02	I	V		6.8E+02	1.4E+09	8.4E+03	1		Bromobenzene	108-86-1					9.3E+03		2.2E+03	1.8E+03
						4.0E-02	X	V		4.0E+03	1.4E+09	3.6E+03	1		Bromochloromethane	74-97-5							6.3E+02	6.3E+02
6.2E-02	I	3.7E-05	C	2.0E-02	I			V		9.3E+02	1.4E+09	4.0E+03	1		Bromodichloromethane	75-27-4	5.3E+01		1.3E+00	1.3E+00	2.3E+04			2.3E+04
7.9E-03	I	1.1E-06	I	2.0E-02	I			V		9.2E+02	1.4E+09	9.7E+03	1		Bromoform	75-25-2	4.1E+02		1.1E+02	8.6E+01	2.3E+04			2.3E+04
				1.4E-03	I	5.0E-03	I	V		3.6E+03	1.4E+09	1.4E+03	1		Bromomethane	74-83-9					1.6E+03		3.1E+01	3.0E+01
				5.0E-03	H			V			1.4E+09	1.2E+05	1		Bromophos	2104-96-3					5.8E+03			5.8E+03
						1.0E-01	A	V		9.7E+02	1.4E+09	2.1E+03	1		Bromopropane, 1-	106-94-5							9.4E+02	9.4E+02
1.0E-01	O			1.5E-02	O						1.4E+09		1	0.1	Bromoxynil	1689-84-5	3.2E+01	7.5E+01		2.2E+01	1.8E+04	4.1E+04		1.2E+04
				1.5E-02	O			V			1.4E+09	4.7E+05	1		Bromoxynil Octanoate	1689-99-2					1.8E+04			1.8E+04
3.4E+00	C	3.0E-05	I			2.0E-03	I	V		6.7E+02	1.4E+09	8.7E+02	1		Butadiene, 1,3-	106-99-0	9.6E-01		3.5E-01	2.6E-01			7.6E+00	7.6E+00
				3.0E-02	O						1.4E+09		1	0.1	Butanoic acid, 4-(2,4-dichlorophenoxy)-	94-82-6					3.5E+04	8.3E+04		2.5E+04
				1.0E-01	I			V		7.6E+03	1.4E+09	3.0E+04	1		Butanol, N-	71-36-3					1.2E+05			1.2E+05
				2.0E+00	P	3.0E+01	P	V		2.1E+04	1.4E+09	2.9E+04	1		Butyl alcohol, sec-	78-92-2					2.3E+06		3.8E+06	1.5E+06
				5.0E-02	I			V			1.4E+09	8.6E+04	1		Butylate	2008-41-5					5.8E+04			5.8E+04
2.0E-04	C	5.7E-08	C								1.4E+09		1	0.1	Butylated hydroxyanisole	25013-16-5	1.6E+04	3.9E+04	2.9E+08	1.1E+04				
3.6E-03	P			3.0E-01	P						1.4E+09		1	0.1	Butylated hydroxytoluene	128-37-0	9.1E+02	2.1E+03		6.4E+02	3.5E+05	8.3E+05		2.5E+05
				5.0E-02	P			V		1.1E+02	1.4E+09	8.1E+03	1		Butylbenzene, n-	104-51-8					5.8E+04			5.8E+04
				1.0E-01	X			V		1.5E+02	1.4E+09	7.4E+03	1		Butylbenzene, sec-	135-98-8					1.2E+05			1.2E+05
				1.0E-01	X			V		1.8E+02	1.4E+09	7.4E+03	1		Butylbenzene, tert-	98-06-6					1.2E+05			1.2E+05
				2.0E-02	A						1.4E+09		1	0.1	Cacodylic Acid	75-60-5					2.3E+04	5.5E+04		1.6E+04
		1.8E-03	I	1.0E-03	I	1.0E-05	A				1.4E+09		0.025	0.001	Cadmium (Diet)	7440-43-9			9.3E+03	9.3E+03	1.2E+03	6.9E+03	6.0E+04	9.8E+02
		1.8E-03	I	5.0E-04	I	1.0E-05	A						0.05	0.001	Cadmium (Water)	7440-43-9								
				5.0E-01	I	2.2E-03	C				1.4E+09		1	0.1	Caprolactam	105-60-2					5.8E+05	1.4E+06	1.3E+07	4.0E+05
1.5E-01	C	4.3E-05	C	2.0E-03	I						1.4E+09		1	0.1	Captafol	2425-06-1	2.2E+01	5.2E+01	3.9E+05	1.5E+01	2.3E+03	5.5E+03		1.6E+03
2.3E-03	C	6.6E-07	C	1.3E-01	I						1.4E+09		1	0.1	Captan	133-06-2	1.4E+03	3.4E+03	2.5E+07	1.0E+03	1.5E+05	3.6E+05		1.1E+05
				1.0E-01	I						1.4E+09		1	0.1	Carbaryl	63-25-2					1.2E+05	2.8E+05		8.2E+04
				5.0E-03	I						1.4E+09		1	0.1	Carbofuran	1563-66-2					5.8E+03	1.4E+04		4.1E+03
				1.0E-01	I	7.0E-01	I	V		7.4E+02	1.4E+09	1.2E+03	1		Carbon Disulfide	75-15-0					1.2E+05		3.6E+03	3.5E+03
7.0E-02	I	6.0E-06	I	4.0E-03	I	1.0E-01	I	V		4.6E+02	1.4E+09	1.5E+03	1		Carbon Tetrachloride	56-23-5	4.7E+01		3.1E+00	2.9E+00	4.7E+03		6.5E+02	5.7E+02
						1.0E-01	P	V		5.9E+03	1.4E+09	6.5E+02	1		Carbonyl Sulfide	463-58-1							2.8E+02	2.8E+02
				1.0E-02	I						1.4E+09		1	0.1	Carbosulfan	55285-14-8					1.2E+04	2.8E+04		8.2E+03
				1.0E-01	I						1.4E+09		1	0.1	Carboxin	5234-68-4					1.2E+05	2.8E+05		8.2E+04
						9.0E-04	I				1.4E+09		1		Ceric oxide	1306-38-3							5.4E+06	5.4E+06
				1.0E-01	I			V			1.4E+09	1.5E+05	1		Chloral Hydrate	302-17-0					1.2E+05			1.2E+05
				1.5E-02	I						1.4E+09		1	0.1	Chloramben	133-90-4					1.8E+04	4.1E+04		1.2E+04
4.0E-01	H										1.4E+09		1	0.1	Chloranil	118-75-2	8.1E+00	1.9E+01		5.7E+00				
3.5E-01	I	1.0E-04	I	5.0E-04	I	7.0E-04	I	V			1.4E+09	1.5E+06	1	0.04	Chlordane	12789-03-6	9.3E+00	5.5E+01	1.9E+02	7.7E+00	5.8E+02	3.4E+03	4.7E+03	4.5E+02
1.0E+01	I	4.6E-03	C	3.0E-04	I						1.4E+09		1	0.1	Chlordecone (Kepone)	143-50-0	3.3E-01	7.7E-01	3.6E+03	2.3E-01	3.5E+02	8.3E+02		2.5E+02
				7.0E-04	A						1.4E+09		1	0.1	Chlorfenvinphos	470-90-6					8.2E+02	1.9E+03		5.7E+02
				9.0E-02	O						1.4E+09		1	0.1	Chlorimuron, Ethyl-	90982-32-4					1.1E+05	2.5E+05		7.4E+04
				1.0E-01	I	1.5E-04	A	V		2.8E+03	1.4E+09	1.2E+03	1		Chlorine	7782-50-5					1.2E+05		7.8E-01	7.8E-01
				3.0E-02	I	2.0E-04	I	V			1.4E+09		1		Chlorine Dioxide	10049-04-4					3.5E+04		1.2E+06	3.4E+04
				3.0E-02	I						1.4E+09		1		Chlorite (Sodium Salt)	7758-19-2					3.5E+04			3.5E+04
						5.0E+01	I	V		1.2E+03	1.4E+09	1.0E+03	1		Chloro-1,1-difluoroethane, 1-	75-68-3							2.3E+05	2.3E+05
		3.0E-04	I	2.0E-02	H	2.0E-02	I	V		7.9E+02	1.4E+09	1.1E+03	1		Chloro-1,3-butadiene, 2-	126-99-8			4.4E-02	4.4E-02	2.3E+04		9.4E+01	9.4E+01
4.6E-01	H										1.4E+09		1	0.1	Chloro-2-methylaniline HCl, 4-	3165-93-3	7.1E+00	1.7E+01		5.0E+00				
1.0E-01	P	7.7E-05	C	3.0E-03	X						1.4E+09		1	0.1	Chloro-2-methylaniline, 4-	95-69-2	3.3E+01	7.7E+01	2.2E+05	2.3E+01	3.5E+03	8.3E+03		2.5E+03
2.7E-01	X							V		1.2E+04	1.4E+09	1.6E+04	1		Chloroacetaldehyde, 2-	107-20-0	1.2E+01			1.2E+01				
											1.4E+09		1	0.1	Chloroacetic Acid	79-11-8								
						3.0E-05	I				1.4E+09		1	0.1	Chloroacetophenone, 2-	532-27-4							1.8E+05	1.8E+05
2.0E-01	P			4.0E-03	I						1.4E+09		1	0.1	Chloroaniline, p-	106-47-8	1.6E+01	3.9E+01		1.1E+01	4.7E+03	1.1E+04		3.3E+03
				2.0E-02	I	5.0E-02	P	V		7.6E+02	1.4E+09	6.4E+03	1		Chlorobenzene	108-90-7					2.3E+04		1.4E+03	1.3E+03
				1.0E-01	X						1.4E+09		1	0.1	Chlorobenzene sulfonic acid, p-	98-66-8					1.2E+05	2.8E+05		8.2E+04
1.1E-01	C	3.1E-05	C	2.0E-02	I						1.4E+09		1	0.1	Chlorobenzilate	510-15-6	3.0E+01	7.0E+01	5.4E+05	2.1E+01	2.3E+04	5.5E+04		1.6E+04
				3.0E-02	X						1.4E+09		1	0.1	Chlorobenzoic Acid, p-	74-11-3					3.5E+04	8.3E+04		2.5E+04
				3.0E-03	P	3.0E-01	P	V		2.9E+02	1.4E+09	6.8E+03	1		Chlorobenzotrifluoride, 4-	98-56-6					3.5E+03		8.9E+03	2.5E+03
				4.0E-02	P			V		7.3E+02	1.4E+09	1.8E+03	1		Chlorobutane, 1-	109-69-3					4.7E+04			4.7E+04
						5.0E+01	I	V		1.7E+03	1.4E+09	9.4E+02	1		Chlorodifluoromethane	75-45-6							2.1E+05	2.1E+05
				2.0E-02	P			V		1.1E+05	1.4E+09	7.8E+04	1		Chloroethanol, 2-	107-07-3					2.3E+04			2.3E+04
3.1E-02	C	2.3E-05	I	1.0E-02	I	9.8E-02	A	V		2.5E+03	1.4E+09	2.6E+03	1		Chloroform	67-66-3	1.1E+02		1.4E+00	1.4E+00	1.2E+04		1.1E+03	1.0E+03
						9.0E-02	I	V		1.3E+03	1.4E+09	1.2E+03	1		Chloromethane	74-87-3							4.6E+02	4.6E+02
2.4E+00	C	6.9E-04	C					V		9.3E+03	1.4E+09	5.3E+03	1		Chloromethyl Methyl Ether	107-30-2	1.4E+00		9.5E-02	8.9E-02				
3.0E-01	P			3.0E-03	P	1.0E-05	X				1.4E+09		1	0.1	Chloronitrobenzene, o-	88-73-3	1.1E+01	2.6E+01		7.7E+00	3.5E+03	8.3E+03	6.0E+04	2.4E+03
6.0E-02	P			7.0E-04	P	2.0E-03	P				1.4E+09		1	0.1	Chloronitrobenzene, p-	100-00-5	5.5E+01	1.3E+02		3.8E+01	8.2E+02	1.9E+03	1.2E+07	5.7E+02

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Toxicity and Chemical-specific Information															Contaminant		Carcinogenic Target Risk (TR) = 1E-06				Noncancer Hazard Index (HI) = 1			
SFO (mg/kg-day)$^{-1}$	key	IUR (ug/m^3)$^{-1}$	key	RfD_o (mg/kg-day)	key	RfC_i (mg/m^3)	key	vol	muta-gen	C_{sat} (mg/kg)	PEF (m^3/kg)	VF (m^3/kg)	GIABS	ABS	Analyte	CAS No.	Ingestion SL TR=1E-06 (mg/kg)	Dermal SL TR=1E-06 (mg/kg)	Inhalation SL TR=1E-06 (mg/kg)	Carcinogenic SL TR=1E-06 (mg/kg)	Ingestion SL THQ=1 (mg/kg)	Dermal SL THQ=1 (mg/kg)	Inhalation SL THQ=1 (mg/kg)	Noncarcinogenic SL THI=1 (mg/kg)
				5.0E-03	I			V		2.7E+04	1.4E+09	1.4E+05	1		Chlorophenol, 2-	95-57-8					5.8E+03			5.8E+03
						4.0E-04	C	V		6.2E+02	1.4E+09	4.7E+03	1		Chloropicrin	76-06-2							8.2E+00	8.2E+00
3.1E-03	C	8.9E-07	C	1.5E-02	I						1.4E+09		1	0.1	Chlorothalonil	1897-45-6	1.1E+03	2.5E+03	1.9E+07	7.4E+02	1.8E+04	4.1E+04		1.2E+04
				2.0E-02	I			V		9.1E+02	1.4E+09	8.1E+03	1		Chlorotoluene, o-	95-49-8					2.3E+04			2.3E+04
				2.0E-02	X			V		2.5E+02	1.4E+09	7.3E+03	1		Chlorotoluene, p-	106-43-4					2.3E+04			2.3E+04
2.4E+02	C	6.9E-02	C								1.4E+09		1	0.1	Chlorozotocin	54749-90-5	1.4E-02	3.2E-02	2.4E+02	9.6E-03				
				5.0E-02	O						1.4E+09		1	0.1	Chlorpropham	101-21-3					5.8E+04	1.4E+05		4.1E+04
				1.0E-03	A						1.4E+09		1	0.1	Chlorpyrifos	2921-88-2					1.2E+03	2.8E+03		8.2E+02
				1.0E-02	H						1.4E+09		1	0.1	Chlorpyrifos Methyl	5598-13-0					1.2E+04	2.8E+04		8.2E+03
				2.0E-02	O						1.4E+09		1	0.1	Chlorsulfuron	64902-72-3					2.3E+04	5.5E+04		1.6E+04
				1.0E-02	I						1.4E+09		1	0.1	Chlorthal-dimethyl	1861-32-1					1.2E+04	2.8E+04		8.2E+03
				8.0E-04	H						1.4E+09		1	0.1	Chlorthiophos	60238-56-4					9.3E+02	2.2E+03		6.6E+02
				1.5E+00	I						1.4E+09		0.013		Chromium(III), Insoluble Salts	16065-83-1					1.8E+06			1.8E+06
5.0E-01	C	8.4E-02	S	3.0E-03	I	1.0E-04	I		M		1.4E+09		0.025		Chromium(VI)	18540-29-9	6.5E+00		2.0E+02	6.3E+00	3.5E+03		6.0E+05	3.5E+03
											1.4E+09		0.013		Chromium, Total	7440-47-3								
				1.3E-02	I						1.4E+09		1	0.1	Clofentezine	74115-24-5					1.5E+04	3.6E+04		1.1E+04
		9.0E-03	P	3.0E-04	P	6.0E-06	P				1.4E+09		1		Cobalt	7440-48-4			1.9E+03	1.9E+03	3.5E+02		3.6E+04	3.5E+02
		6.2E-04	I					V	M				1		Coke Oven Emissions	8007-45-2								
				4.0E-02	H						1.4E+09		1		Copper	7440-50-8					4.7E+04			4.7E+04
				5.0E-02	I	6.0E-01	C				1.4E+09		1	0.1	Cresol, m-	108-39-4					5.8E+04	1.4E+05	3.6E+09	4.1E+04
				5.0E-02	I	6.0E-01	C				1.4E+09		1	0.1	Cresol, o-	95-48-7					5.8E+04	1.4E+05	3.6E+09	4.1E+04
				1.0E-01	A	6.0E-01	C				1.4E+09		1	0.1	Cresol, p-	106-44-5					1.2E+05	2.8E+05	3.6E+09	8.2E+04
				1.0E-01	A						1.4E+09		1	0.1	Cresol, p-chloro-m-	59-50-7					1.2E+05	2.8E+05		8.2E+04
				1.0E-01	A	6.0E-01	C				1.4E+09		1	0.1	Cresols	1319-77-3					1.2E+05	2.8E+05	3.6E+09	8.2E+04
1.9E+00	H			1.0E-03	P			V		1.7E+04	1.4E+09	1.9E+04	1		Crotonaldehyde, trans-	123-73-9	1.7E+00			1.7E+00	1.2E+03			1.2E+03
				1.0E-01	I	4.0E-01	I	V		2.7E+02	1.4E+09	6.2E+03	1		Cumene	98-82-8					1.2E+05		1.1E+04	9.9E+03
2.2E-01	C	6.3E-05	C								1.4E+09		1	0.1	Cupferron	135-20-6	1.5E+01	3.5E+01	2.6E+05	1.0E+01				
8.4E-01	H			2.0E-03	H						1.4E+09		1	0.1	Cyanazine	21725-46-2	3.9E+00	9.2E+00		2.7E+00	2.3E+03	5.5E+03		1.6E+03
															Cyanides									
				1.0E-03	I						1.4E+09		1		~Calcium Cyanide	592-01-8					1.2E+03			1.2E+03
				5.0E-03	I						1.4E+09		1		~Copper Cyanide	544-92-3					5.8E+03			5.8E+03
				6.0E-04	I	8.0E-04	S	V		9.5E+05	1.4E+09	5.3E+04	1		~Cyanide (CN-)	57-12-5					7.0E+02		1.9E+02	1.5E+02
				1.0E-03	I			V			1.4E+09		1		~Cyanogen	460-19-5					1.2E+03			1.2E+03
				9.0E-02	I			V			1.4E+09		1		~Cyanogen Bromide	506-68-3					1.1E+05			1.1E+05
				5.0E-02	I			V			1.4E+09		1		~Cyanogen Chloride	506-77-4					5.8E+04			5.8E+04
				6.0E-04	I	8.0E-04	I	V		1.0E+07	1.4E+09	5.2E+04	1		~Hydrogen Cyanide	74-90-8					7.0E+02		1.8E+02	1.5E+02
				2.0E-03	I						1.4E+09		1		~Potassium Cyanide	151-50-8					2.3E+03			2.3E+03
				5.0E-03	I						1.4E+09		0.04		~Potassium Silver Cyanide	506-61-6					5.8E+03			5.8E+03
				1.0E-01	I						1.4E+09		0.04		~Silver Cyanide	506-64-9					1.2E+05			1.2E+05
				1.0E-03	I						1.4E+09		1		~Sodium Cyanide	143-33-9					1.2E+03			1.2E+03
				2.0E-04	P						1.4E+09		1		~Thiocyanates	E1790664					2.3E+02			2.3E+02
				2.0E-04	X			V			1.4E+09		1		~Thiocyanic Acid	463-56-9					2.3E+02			2.3E+02
				5.0E-02	I						1.4E+09		1		~Zinc Cyanide	557-21-1					5.8E+04			5.8E+04
						6.0E+00	I	V		1.2E+02	1.4E+09	1.0E+03	1		Cyclohexane	110-82-7							2.7E+04	2.7E+04
2.0E-02	X			2.0E-02	X						1.4E+09		1	0.1	Cyclohexane, 1,2,3,4,5-pentabromo-6-chloro-	87-84-3	1.6E+02	3.9E+02		1.1E+02	2.3E+04	5.5E+04		1.6E+04
				5.0E+00	I	7.0E-01	P	V		5.1E+03	1.4E+09	4.2E+04	1		Cyclohexanone	108-94-1					5.8E+06		1.3E+05	1.3E+05
				5.0E-03	P	1.0E+00	X	V		2.8E+02	1.4E+09	1.5E+03	1		Cyclohexene	110-83-8					5.8E+03		6.4E+03	3.1E+03
				2.0E-01	I			V		2.9E+05	1.4E+09	7.5E+04	1		Cyclohexylamine	108-91-8					2.3E+05			2.3E+05
				2.5E-02	I						1.4E+09		1	0.1	Cyfluthrin	68359-37-5					2.9E+04	6.9E+04		2.1E+04
				1.0E-03	O						1.4E+09		1	0.1	Cyhalothrin	68085-85-8					1.2E+03	2.8E+03		8.2E+02
				6.0E-02	O						1.4E+09		1	0.1	Cypermethrin	52315-07-8					7.0E+04	1.7E+05		4.9E+04
				1.5E-02	O						1.4E+09		1	0.1	Cyromazine	66215-27-8					1.8E+04	4.1E+04		1.2E+04
2.4E-01	I	6.9E-05	C	3.0E-05	X						1.4E+09		1	0.1	DDD, p,p`- (DDD)	72-54-8	1.4E+01	3.2E+01	2.4E+05	9.6E+00	3.5E+01	8.3E+01		2.5E+01
3.4E-01	I	9.7E-05	C	3.0E-04	X			V			1.4E+09	2.1E+06	1		DDE, p,p'-	72-55-9	9.6E+00		2.7E+02	9.3E+00	3.5E+02			3.5E+02
3.4E-01	I	9.7E-05	I	5.0E-04	I						1.4E+09		1	0.03	DDT	50-29-3	9.6E+00	7.6E+01	1.7E+05	8.5E+00	5.8E+02	4.6E+03		5.2E+02
				3.0E-02	I						1.4E+09		1	0.1	Dalapon	75-99-0					3.5E+04	8.3E+04		2.5E+04
1.8E-02	C	5.1E-06	C	1.5E-01	I						1.4E+09		1	0.1	Daminozide	1596-84-5	1.8E+02	4.3E+02	3.3E+06	1.3E+02	1.8E+05	4.1E+05		1.2E+05
7.0E-04	I			7.0E-03	I						1.4E+09		1	0.1	Decabromodiphenyl ether, 2,2',3,3',4,4',5,5',6,6'- (BDE-209)	1163-19-5	4.7E+03	1.1E+04		3.3E+03	8.2E+03	1.9E+04		5.7E+03
				4.0E-05	I						1.4E+09		1	0.1	Demeton	8065-48-3					4.7E+01	1.1E+02		3.3E+01
1.2E-03	I			6.0E-01	I						1.4E+09		1	0.1	Di(2-ethylhexyl)adipate	103-23-1	2.7E+03	6.4E+03		1.9E+03	7.0E+05	1.7E+06		4.9E+05
6.1E-02	H										1.4E+09		1	0.1	Diallate	2303-16-4	5.4E+01	1.3E+02		3.8E+01				
				7.0E-04	A						1.4E+09		1	0.1	Diazinon	333-41-5					8.2E+02	1.9E+03		5.7E+02
				1.0E-02	X			V			1.4E+09	5.2E+05	1		Dibenzothiophene	132-65-0					1.2E+04			1.2E+04
8.0E-01	P	6.0E-03	P	2.0E-04	P	2.0E-04	I	V	M	9.8E+02	1.4E+09	3.2E+04	1		Dibromo-3-chloropropane, 1,2-	96-12-8	4.1E+00		6.5E-02	6.4E-02	2.3E+02		2.8E+01	2.5E+01
				4.0E-04	X			V		1.6E+02	1.4E+09	1.9E+04	1		Dibromobenzene, 1,3-	108-36-1					4.7E+02			4.7E+02
				1.0E-02	I			V			1.4E+09	2.2E+04	1		Dibromobenzene, 1,4-	106-37-6					1.2E+04			1.2E+04
8.4E-02	I			2.0E-02	I			V		8.0E+02	1.4E+09	7.9E+03	1		Dibromochloromethane	124-48-1	3.9E+01			3.9E+01	2.3E+04			2.3E+04
2.0E+00	I	6.0E-04	I	9.0E-03	I	9.0E-03	I	V		1.3E+03	1.4E+09	8.6E+03	1		Dibromoethane, 1,2-	106-93-4	1.6E+00		1.8E-01	1.6E-01	1.1E+04		3.4E+02	3.3E+02
						4.0E-03	X	V		2.8E+03	1.4E+09	5.6E+03	1		Dibromomethane (Methylene Bromide)	74-95-3							9.9E+01	9.9E+01
				3.0E-04	P						1.4E+09		1	0.1	Dibutyltin Compounds	E1790660					3.5E+02	8.3E+02		2.5E+02

Key: I = IRIS; P = PPRTV; D = DWSHA; O = OPP; A = ATSDR; C = Cal EPA; X = APPENDIX PPRTV SCREEN (See FAQ #29); H = HEAST; F = See FAQ; E = see user guide Section 2.3.5; W = see user guide Section 2.3.6; L = see user guide on lead; M = mutagen; S = see user guide Section 5; V = volatile; R = RBA applied (See User Guide for Arsenic notice) ; c = cancer; n = noncancer; * = where: n SL < 100X c SL; ** = where n SL < 10X c SL; SSL values are based on DAF=1; m = Concentration may exceed ceiling limit (See User Guide); s = Concentration may exceed Csat (See User Guide)

Toxicity and Chemical-specific Information														Contaminant		Carcinogenic Target Risk (TR) = 1E-06				Noncancer Hazard Index (HI) = 1			
SFO (mg/kg-day)$^{-1}$	key	IUR (ug/m^3)$^{-1}$	key	RfD_o (mg/kg-day)	key	RfC_i (mg/m^3)	key	vol	muta-gen	C_{sat} (mg/kg)	PEF (m^3/kg)	VF (m^3/kg)	GIABS	ABS	Analyte	CAS No.	Ingestion SL TR=1E-06 (mg/kg)	Dermal SL TR=1E-06 (mg/kg)	Inhalation SL TR=1E-06 (mg/kg)	Carcinogenic SL TR=1E-06 (mg/kg)	Ingestion SL THQ=1 (mg/kg)	Dermal SL THQ=1 (mg/kg)	Inhalation SL THQ=1 (mg/kg)	Noncarcinogenic SL THI=1 (mg/kg)
				3.0E-02	I						1.4E+09		1	0.1	Dicamba	1918-00-9					3.5E+04	8.3E+04		2.5E+04
		4.2E-03	P					V		5.5E+02	1.4E+09	3.2E+03	1		Dichloro-2-butene, 1,4-	764-41-0			9.4E-03	9.4E-03				
		4.2E-03	P					V		5.2E+02	1.4E+09	1.1E+04	1		Dichloro-2-butene, cis-1,4-	1476-11-5			3.2E-02	3.2E-02				
		4.2E-03	P					V		7.6E+02	1.4E+09	1.1E+04	1		Dichloro-2-butene, trans-1,4-	110-57-6			3.2E-02	3.2E-02				
5.0E-02	I			4.0E-03	I						1.4E+09		1	0.1	Dichloroacetic Acid	79-43-6	6.5E+01	1.5E+02		4.6E+01	4.7E+03	1.1E+04		3.3E+03
				9.0E-02	I	2.0E-01	H	V		3.8E+02	1.4E+09	1.2E+04	1		Dichlorobenzene, 1,2-	95-50-1					1.1E+05		1.0E+04	9.3E+03
5.4E-03	C	1.1E-05	C	7.0E-02	A	8.0E-01	I	V			1.4E+09	1.0E+04	1		Dichlorobenzene, 1,4-	106-46-7	6.1E+02		1.2E+01	1.1E+01	8.2E+04		3.7E+04	2.5E+04
4.5E-01	I	3.4E-04	C								1.4E+09		1	0.1	Dichlorobenzidine, 3,3'-	91-94-1	7.3E+00	1.7E+01	4.9E+04	5.1E+00				
				9.0E-03	X						1.4E+09		1	0.1	Dichlorobenzophenone, 4,4'-	90-98-2					1.1E+04	2.5E+04		7.4E+03
				2.0E-01	I	1.0E-01	X	V		8.5E+02	1.4E+09	8.4E+02	1		Dichlorodifluoromethane	75-71-8					2.3E+05		3.7E+02	3.7E+02
5.7E-03	C	1.6E-06	C	2.0E-01	P			V		1.7E+03	1.4E+09	2.1E+03	1		Dichloroethane, 1,1-	75-34-3	5.7E+02		1.6E+01	1.6E+01	2.3E+05			2.3E+05
9.1E-02	I	2.6E-05	I	6.0E-03	X	7.0E-03	P	V		3.0E+03	1.4E+09	4.6E+03	1		Dichloroethane, 1,2-	107-06-2	3.6E+01		2.2E+00	2.0E+00	7.0E+03		1.4E+02	1.4E+02
				5.0E-02	I	2.0E-01	I	V		1.2E+03	1.4E+09	1.2E+03	1		Dichloroethylene, 1,1-	75-35-4					5.8E+04		1.0E+03	1.0E+03
				2.0E-03	I			V		2.4E+03	1.4E+09	2.5E+03	1		Dichloroethylene, 1,2-cis-	156-59-2					2.3E+03			2.3E+03
				2.0E-02	I			V		1.9E+03	1.4E+09	1.7E+03	1		Dichloroethylene, 1,2-trans-	156-60-5					2.3E+04			2.3E+04
				3.0E-03	I						1.4E+09		1	0.1	Dichlorophenol, 2,4-	120-83-2					3.5E+03	8.3E+03		2.5E+03
				1.0E-02	I						1.4E+09		1	0.05	Dichlorophenoxy Acetic Acid, 2,4-	94-75-7					1.2E+04	5.5E+04		9.6E+03
3.7E-02	P	3.7E-06	P	4.0E-02	P	4.0E-03	I	V		1.4E+03	1.4E+09	3.8E+03	1		Dichloropropane, 1,2-	78-87-5	8.8E+01		1.3E+01	1.1E+01	4.7E+04		6.6E+01	6.6E+01
				2.0E-02	P			V		1.5E+03	1.4E+09	6.8E+03	1		Dichloropropane, 1,3-	142-28-9					2.3E+04			2.3E+04
				3.0E-03	I						1.4E+09		1	0.1	Dichloropropanol, 2,3-	616-23-9					3.5E+03	8.3E+03		2.5E+03
1.0E-01	I	4.0E-06	I	3.0E-02	I	2.0E-02	I	V		1.6E+03	1.4E+09	3.6E+03	1		Dichloropropene, 1,3-	542-75-6	3.3E+01		1.1E+01	8.2E+00	3.5E+04		3.1E+02	3.1E+02
2.9E-01	I	8.3E-05	C	5.0E-04	I	5.0E-04	I				1.4E+09		1	0.1	Dichlorvos	62-73-7	1.1E+01	2.7E+01	2.0E+05	7.9E+00	5.8E+02	1.4E+03	3.0E+06	4.1E+02
				7.0E-05	O						1.4E+09		1	0.1	Dicrotophos	141-66-2					8.2E+01	1.9E+02		5.7E+01
				8.0E-02	P	3.0E-04	X	V		2.6E+02	1.4E+09	4.1E+03	1		Dicyclopentadiene	77-73-6					9.3E+04		5.4E+00	5.4E+00
1.6E+01	I	4.6E-03	I	5.0E-05	I						1.4E+09		1	0.1	Dieldrin	60-57-1	2.0E-01	4.8E-01	3.6E+03	1.4E-01	5.8E+01	1.4E+02		4.1E+01
		3.0E-04	C			5.0E-03	I						1	0.1	Diesel Engine Exhaust	E17136615								
				2.0E-03	P	2.0E-04	P				1.4E+09		1	0.1	Diethanolamine	111-42-2					2.3E+03	5.5E+03	1.2E+06	1.6E+03
				3.0E-02	P	1.0E-04	P				1.4E+09		1	0.1	Diethylene Glycol Monobutyl Ether	112-34-5					3.5E+04	8.3E+04	6.0E+05	2.4E+04
				6.0E-02	P	3.0E-04	P				1.4E+09		1	0.1	Diethylene Glycol Monoethyl Ether	111-90-0					7.0E+04	1.7E+05	1.8E+06	4.8E+04
				1.0E-03	P			V		1.1E+05	1.4E+09	1.4E+05	1		Diethylformamide	617-84-5					1.2E+03			1.2E+03
3.5E+02	C	1.0E-01	C								1.4E+09		1	0.1	Diethylstilbestrol	56-53-1	9.3E-03	2.2E-02	1.7E+02	6.6E-03				
				8.3E-02	O						1.4E+09		1	0.1	Difenzoquat	43222-48-6					9.7E+04	2.3E+05		6.8E+04
				2.0E-02	I						1.4E+09		1	0.1	Diflubenzuron	35367-38-5					2.3E+04	5.5E+04		1.6E+04
						4.0E+01	I	V		1.4E+03	1.4E+09	1.1E+03	1		Difluoroethane, 1,1-	75-37-6							2.0E+05	2.0E+05
						3.0E+01	X	V		6.9E+02	1.4E+09	7.6E+02	1		Difluoropropane, 2,2-	420-45-1							1.0E+05	1.0E+05
4.4E-02	C	1.3E-05	C					V			1.4E+09	1.2E+05	1		Dihydrosafrole	94-58-6	7.4E+01		1.2E+02	4.5E+01				
						7.0E-01	P	V		2.3E+03	1.4E+09	3.1E+03	1		Diisopropyl Ether	108-20-3							9.4E+03	9.4E+03
				8.0E-02	I			V		5.3E+02	1.4E+09	3.8E+04	1		Diisopropyl Methylphosphonate	1445-75-6					9.3E+04			9.3E+04
				2.2E-02	O						1.4E+09		1	0.1	Dimethipin	55290-64-7					2.5E+04	6.0E+04		1.8E+04
				2.2E-03	O						1.4E+09		1	0.1	Dimethoate	60-51-5					2.6E+03	6.1E+03		1.8E+03
1.6E+00	P										1.4E+09		1	0.1	Dimethoxybenzidine, 3,3'-	119-90-4	2.0E+00	4.8E+00		1.4E+00				
1.7E-03	P			6.0E-02	P						1.4E+09		1	0.1	Dimethyl methylphosphonate	756-79-6	1.9E+03	4.5E+03		1.4E+03	7.0E+04	1.7E+05		4.9E+04
4.6E+00	C	1.3E-03	C								1.4E+09		1	0.1	Dimethylamino azobenzene [p-]	60-11-7	7.1E-01	1.7E+00	1.3E+04	5.0E-01				
5.8E-01	H										1.4E+09		1	0.1	Dimethylaniline HCl, 2,4-	21436-96-4	5.6E+00	1.3E+01		4.0E+00				
2.0E-01	P			2.0E-03	X						1.4E+09		1	0.1	Dimethylaniline, 2,4-	95-68-1	1.6E+01	3.9E+01		1.1E+01	2.3E+03	5.5E+03		1.6E+03
2.7E-02	P			2.0E-03	I			V		8.3E+02	1.4E+09	3.1E+04	1		Dimethylaniline, N,N-	121-69-7	1.2E+02			1.2E+02	2.3E+03			2.3E+03
1.1E+01	P										1.4E+09		1	0.1	Dimethylbenzidine, 3,3'-	119-93-7	3.0E-01	7.0E-01		2.1E-01				
				1.0E-01	P	3.0E-02	I	V		1.1E+05	1.4E+09	1.3E+05	1		Dimethylformamide	68-12-2					1.2E+05		1.7E+04	1.5E+04
				1.0E-04	X	2.0E-06	X	V		1.7E+05	1.4E+09	2.8E+04	1		Dimethylhydrazine, 1,1-	57-14-7					1.2E+02		2.4E-01	2.4E-01
5.5E+02	C	1.6E-01	C					V		1.9E+05	1.4E+09	1.7E+05	1		Dimethylhydrazine, 1,2-	540-73-8	5.9E-03		1.3E-02	4.1E-03				
				2.0E-02	I						1.4E+09		1	0.1	Dimethylphenol, 2,4-	105-67-9					2.3E+04	5.5E+04		1.6E+04
				6.0E-04	I						1.4E+09		1	0.1	Dimethylphenol, 2,6-	576-26-1					7.0E+02	1.7E+03		4.9E+02
				1.0E-03	I						1.4E+09		1	0.1	Dimethylphenol, 3,4-	95-65-8					1.2E+03	2.8E+03		8.2E+02
4.5E-02	C	1.3E-05	C					V		4.7E+02	1.4E+09	5.5E+03	1		Dimethylvinylchloride	513-37-1	7.3E+01		5.2E+00	4.8E+00				
				8.0E-05	X						1.4E+09		1	0.1	Dinitro-o-cresol, 4,6-	534-52-1					9.3E+01	2.2E+02		6.6E+01
				2.0E-03	I						1.4E+09		1	0.1	Dinitro-o-cyclohexyl Phenol, 4,6-	131-89-5					2.3E+03	5.5E+03		1.6E+03
				1.0E-04	P						1.4E+09		1	0.1	Dinitrobenzene, 1,2-	528-29-0					1.2E+02	2.8E+02		8.2E+01
				1.0E-04	I						1.4E+09		1	0.1	Dinitrobenzene, 1,3-	99-65-0					1.2E+02	2.8E+02		8.2E+01
				1.0E-04	P						1.4E+09		1	0.1	Dinitrobenzene, 1,4-	100-25-4					1.2E+02	2.8E+02		8.2E+01
				2.0E-03	I						1.4E+09		1	0.1	Dinitrophenol, 2,4-	51-28-5					2.3E+03	5.5E+03		1.6E+03
6.8E-01	I										1.4E+09		1	0.1	Dinitrotoluene Mixture, 2,4/2,6-	E1615210	4.8E+00	1.1E+01		3.4E+00				
3.1E-01	C	8.9E-05	C	2.0E-03	I						1.4E+09		1	0.102	Dinitrotoluene, 2,4-	121-14-2	1.1E+01	2.4E+01	1.9E+05	7.4E+00	2.3E+03	5.4E+03		1.6E+03
1.5E+00	P			3.0E-04	X						1.4E+09		1	0.099	Dinitrotoluene, 2,6-	606-20-2	2.2E+00	5.2E+00		1.5E+00	3.5E+02	8.4E+02		2.5E+02
				2.0E-03	S						1.4E+09		1	0.006	Dinitrotoluene, 2-Amino-4,6-	35572-78-2					2.3E+03	9.2E+04		2.3E+03
				2.0E-03	S						1.4E+09		1	0.009	Dinitrotoluene, 4-Amino-2,6-	19406-51-0					2.3E+03	6.1E+04		2.3E+03
4.5E-01	X			9.0E-04	X						1.4E+09		1	0.1	Dinitrotoluene, Technical grade	25321-14-6	7.3E+00	1.7E+01		5.1E+00	1.1E+03	2.5E+03		7.4E+02
				1.0E-03	I						1.4E+09		1	0.1	Dinoseb	88-85-7					1.2E+03	2.8E+03		8.2E+02
1.0E-01	I	5.0E-06	I	3.0E-02	I	3.0E-02	I	V		1.2E+05	1.4E+09	4.0E+04	1		Dioxane, 1,4-	123-91-1	3.3E+01		9.7E+01	2.4E+01	3.5E+04		5.2E+03	4.5E+03
															Dioxins									
6.2E+03	I	1.3E+00	I								1.4E+09		1	0.03	~Hexachlorodibenzo-p-dioxin, Mixture		5.3E-04	4.2E-03	1.3E+01	4.7E-04				

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Toxicity and Chemical-specific Information														Contaminant		Carcinogenic Target Risk (TR) = 1E-06				Noncancer Hazard Index (HI) = 1			
SFO $(mg/kg\text{-}day)^{-1}$	key	IUR $(ug/m^3)^{-1}$	key	RfD_o (mg/kg-day)	key	RfC_i (mg/m^3)	key	vol	muta-gen	C_{sat} (mg/kg)	PEF (m^3/kg)	VF (m^3/kg)	GIABS	ABS	Analyte	CAS No.	Ingestion SL TR=1E-06 (mg/kg)	Dermal SL TR=1E-06 (mg/kg)	Inhalation SL TR=1E-06 (mg/kg)	Carcinogenic SL TR=1E-06 (mg/kg)	Ingestion SL THQ=1 (mg/kg)	Dermal SL THQ=1 (mg/kg)	Inhalation SL THQ=1 (mg/kg)	Noncarcinogenic SL THI=1 (mg/kg)
1.3E+05	C	3.8E+01	C	7.0E-10	I	4.0E-08	C	V			1.4E+09	2.0E+06	1	0.03	~TCDD, 2,3,7,8-	1746-01-6	2.5E-05	2.0E-04	6.3E-04	2.2E-05	8.2E-04	6.4E-03	3.4E-01	7.2E-04
				3.0E-02	I						1.4E+09		1	0.1	Diphenamid	957-51-7					3.5E+04	8.3E+04		2.5E+04
						4.0E-04	X	V			1.4E+09	8.1E+04	1		Diphenyl Ether	101-84-8							1.4E+02	1.4E+02
				8.0E-04	X						1.4E+09		1	0.1	Diphenyl Sulfone	127-63-9					9.3E+02	2.2E+03		6.6E+02
				1.0E-01	O						1.4E+09		1	0.1	Diphenylamine	122-39-4					1.2E+05	2.8E+05		8.2E+04
8.0E-01	I	2.2E-04	I								1.4E+09		1	0.1	Diphenylhydrazine, 1,2-	122-66-7	4.1E+00	9.7E+00	7.6E+04	2.9E+00				
				2.2E-03	I						1.4E+09		1	0.1	Diquat	85-00-7					2.6E+03	6.1E+03		1.8E+03
7.1E+00	C	1.4E-01	C								1.4E+09		1	0.1	Direct Black 38	1937-37-7	4.6E-01	1.1E+00	1.2E+02	3.2E-01				
7.4E+00	C	1.4E-01	C								1.4E+09		1	0.1	Direct Blue 6	2602-46-2	4.4E-01	1.0E+00	1.2E+02	3.1E-01				
6.7E+00	C	1.4E-01	C								1.4E+09		1	0.1	Direct Brown 95	16071-86-6	4.9E-01	1.2E+00	1.2E+02	3.4E-01				
				4.0E-05	I						1.4E+09		1	0.1	Disulfoton	298-04-4					4.7E+01	1.1E+02		3.3E+01
				1.0E-02	I			V			1.4E+09	4.5E+04	1		Dithiane, 1,4-	505-29-3					1.2E+04			1.2E+04
				2.0E-03	I						1.4E+09		1	0.1	Diuron	330-54-1					2.3E+03	5.5E+03		1.6E+03
				2.0E-02	O						1.4E+09		1	0.1	Dodine	2439-10-3					2.3E+04	5.5E+04		1.6E+04
				5.0E-02	O			V			1.4E+09	1.2E+05	1		EPTC	759-94-4					5.8E+04			5.8E+04
				6.0E-03	I			V			1.4E+09	4.1E+05	1		Endosulfan	115-29-7					7.0E+03			7.0E+03
				2.0E-02	I						1.4E+09		1	0.1	Endothall	145-73-3					2.3E+04	5.5E+04		1.6E+04
				3.0E-04	I						1.4E+09		1	0.1	Endrin	72-20-8					3.5E+02	8.3E+02		2.5E+02
9.9E-03	I	1.2E-06	I	6.0E-03	P	1.0E-03	I	V		1.1E+04	1.4E+09	1.9E+04	1		Epichlorohydrin	106-89-8	3.3E+02		1.9E+02	1.2E+02	7.0E+03		8.3E+01	8.2E+01
				2.0E-02	I	1.0E-02	I	V		1.5E+04	1.4E+09	7.7E+03	1		Epoxybutane, 1,2-	106-88-7							6.7E+02	6.7E+02
				4.0E-02	P						1.4E+09		1	0.1	Ethanol, 2-(2-methoxyethoxy)-	111-77-3					4.7E+04	1.1E+05		3.3E+04
				5.0E-03	I						1.4E+09		1	0.1	Ethephon	16672-87-0					5.8E+03	1.4E+04		4.1E+03
				5.0E-04	I						1.4E+09		1	0.1	Ethion	563-12-2					5.8E+02	1.4E+03		4.1E+02
				1.0E-01	P	6.0E-02	P	V		2.4E+04	1.4E+09	6.1E+04	1		Ethoxyethanol Acetate, 2-	111-15-9					1.2E+05		1.6E+04	1.4E+04
				9.0E-02	P	2.0E-01	I	V		1.1E+05	1.4E+09	9.8E+04	1		Ethoxyethanol, 2-	110-80-5					1.1E+05		8.6E+04	4.7E+04
				9.0E-01	I	7.0E-02	P	V		1.1E+04	1.4E+09	8.6E+03	1		Ethyl Acetate	141-78-6					1.1E+06		2.6E+03	2.6E+03
				5.0E-03	P	8.0E-03	P	V		2.5E+03	1.4E+09	6.3E+03	1		Ethyl Acrylate	140-88-5					5.8E+03		2.2E+02	2.1E+02
						1.0E+01	I	V		2.1E+03	1.4E+09	1.3E+03	1		Ethyl Chloride (Chloroethane)	75-00-3							5.7E+04	5.7E+04
				2.0E-01	I			V		1.0E+04	1.4E+09	3.1E+03	1		Ethyl Ether	60-29-7					2.3E+05			2.3E+05
						3.0E-01	P	V		1.1E+03	1.4E+09	5.8E+03	1		Ethyl Methacrylate	97-63-2							7.6E+03	7.6E+03
				1.0E-05	I						1.4E+09		1	0.1	Ethyl-p-nitrophenyl Phosphonate	2104-64-5					1.2E+01	2.8E+01		8.2E+00
1.1E-02	C	2.5E-06	C	1.0E-01	I	1.0E+00	I	V		4.8E+02	1.4E+09	5.7E+03	1		Ethylbenzene	100-41-4	3.0E+02		2.8E+01	2.5E+01	1.2E+05		2.5E+04	2.0E+04
				7.0E-02	P						1.4E+09		1	0.1	Ethylene Cyanohydrin	109-78-4					8.2E+04	1.9E+05		5.7E+04
				9.0E-02	P			V		1.9E+05	1.4E+09	1.8E+05	1		Ethylene Diamine	107-15-3					1.1E+05			1.1E+05
				2.0E+00	I	4.0E-01	C				1.4E+09		1	0.1	Ethylene Glycol	107-21-1					2.3E+06	5.5E+06	2.4E+09	1.6E+06
				1.0E-01	I	1.6E+00	I				1.4E+09		1	0.1	Ethylene Glycol Monobutyl Ether	111-76-2					1.2E+05	2.8E+05	9.5E+09	8.2E+04
3.1E-01	C	3.0E-03	I			3.0E-02	C	V	M	1.2E+05	1.4E+09	6.1E+03	1		Ethylene Oxide	75-21-8	1.1E+01		2.5E-02	2.5E-02			8.0E+02	8.0E+02
4.5E-02	C	1.3E-05	C	8.0E-05	I						1.4E+09		1	0.1	Ethylene Thiourea	96-45-7	7.3E+01	1.7E+02	1.3E+06	5.1E+01	9.3E+01	2.2E+02		6.6E+01
6.5E+01	C	1.9E-02	C					V		1.5E+05	1.4E+09	2.4E+04	1		Ethyleneimine	151-56-4	5.0E-02		1.5E-02	1.2E-02				
				3.0E+00	I						1.4E+09		1	0.1	Ethylphthalyl Ethyl Glycolate	84-72-0					3.5E+06	8.3E+06		2.5E+06
				2.5E-04	I						1.4E+09		1	0.1	Fenamiphos	22224-92-6					2.9E+02	6.9E+02		2.1E+02
				2.5E-02	I						1.4E+09		1	0.1	Fenpropathrin	39515-41-8					2.9E+04	6.9E+04		2.1E+04
				2.5E-02	I						1.4E+09		1	0.1	Fenvalerate	51630-58-1					2.9E+04	6.9E+04		2.1E+04
				1.3E-02	I						1.4E+09		1	0.1	Fluometuron	2164-17-2					1.5E+04	3.6E+04		1.1E+04
				4.0E-02	C	1.3E-02	C				1.4E+09		1		Fluoride	16984-48-8					4.7E+04		7.7E+07	4.7E+04
				6.0E-02	I	1.3E-02	C				1.4E+09		1		Fluorine (Soluble Fluoride)	7782-41-4					7.0E+04		7.7E+07	7.0E+04
				8.0E-02	I						1.4E+09		1	0.1	Fluridone	59756-60-4					9.3E+04	2.2E+05		6.6E+04
				1.5E-02	O						1.4E+09		1	0.1	Flurprimidol	56425-91-3					1.8E+04	4.1E+04		1.2E+04
				2.0E-03	O						1.4E+09		1	0.1	Flusilazole	85509-19-9					2.3E+03	5.5E+03		1.6E+03
				5.0E-01	O						1.4E+09		1	0.1	Flutolanil	66332-96-5					5.8E+05	1.4E+06		4.1E+05
				1.0E-02	I						1.4E+09		1	0.1	Fluvalinate	69409-94-5					1.2E+04	2.8E+04		8.2E+03
				9.0E-02	O						1.4E+09		1	0.1	Folpet	133-07-3					1.1E+05	2.5E+05		7.4E+04
				2.5E-03	O						1.4E+09		1	0.1	Fomesafen	72178-02-0					2.9E+03	6.9E+03		2.1E+03
				2.0E-03	I						1.4E+09		1	0.1	Fonofos	944-22-9					2.3E+03	5.5E+03		1.6E+03
		1.3E-05	I	2.0E-01	I	9.8E-03	A	V		4.2E+04	1.4E+09	7.8E+04	1		Formaldehyde	50-00-0			7.3E+01	7.3E+01	2.3E+05		3.3E+03	3.3E+03
				9.0E-01	P	3.0E-04	X	V		1.1E+05	1.4E+09	9.3E+04	1		Formic Acid	64-18-6					1.1E+06		1.2E+02	1.2E+02
				2.5E+00	O						1.4E+09		1	0.1	Fosetyl-AL	39148-24-8					2.9E+06	6.9E+06		2.1E+06
															Furans									
				1.0E-03	X			V			1.4E+09	1.6E+05	1	0.03	~Dibenzofuran	132-64-9					1.2E+03	9.2E+03		1.0E+03
				1.0E-03	I			V		6.2E+03	1.4E+09	2.6E+03	1	0.03	~Furan	110-00-9					1.2E+03	9.2E+03		1.0E+03
				9.0E-01	I	2.0E+00	I	V		1.7E+05	1.4E+09	1.2E+04	1	0.03	~Tetrahydrofuran	109-99-9					1.1E+06	8.3E+06	1.0E+05	9.4E+04
3.8E+00	H										1.4E+09		1	0.1	Furazolidone	67-45-8	8.6E-01	2.0E+00		6.0E-01				
				3.0E-03	I	5.0E-02	H	V		1.0E+04	1.4E+09	4.9E+04	1		Furfural	98-01-1					3.5E+03		1.1E+04	2.6E+03
1.5E+00	C	4.3E-04	C								1.4E+09		1	0.1	Furium	531-82-8	2.2E+00	5.2E+00	3.9E+04	1.5E+00				
3.0E-02	I	8.6E-06	C								1.4E+09		1	0.1	Furmecyclox	60568-05-0	1.1E+02	2.6E+02	1.9E+06	7.7E+01				
				6.0E-03	O						1.4E+09		1	0.1	Glufosinate, Ammonium	77182-82-2					7.0E+03	1.7E+04		4.9E+03
				1.0E-01	A	8.0E-05	C				1.4E+09		1	0.1	Glutaraldehyde	111-30-8					1.2E+05	2.8E+05	4.8E+05	7.0E+04
				4.0E-04	I	1.0E-03	H	V		1.1E+05	1.4E+09	8.4E+04	1		Glycidyl	765-34-4					4.7E+02		3.7E+02	2.1E+02
				1.0E-01	I						1.4E+09		1	0.1	Glyphosate	1071-83-6					1.2E+05	2.8E+05		8.2E+04
				1.0E-02	X			V			1.4E+09	1.5E+05	1		Guanidine	113-00-8					1.2E+04			1.2E+04

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Toxicity and Chemical-specific Information														Contaminant		Carcinogenic Target Risk (TR) = 1E-06				Noncancer Hazard Index (HI) = 1			
SFO $(mg/kg\text{-}day)^{-1}$	key	IUR $(ug/m^3)^{-1}$	key	RfD_o (mg/kg-day)	key	RfC_i (mg/m^3)	key	vol	muta-gen	C_{sat} (mg/kg)	PEF (m^3/kg)	VF (m^3/kg)	GIABS	ABS	Analyte	CAS No.	Ingestion SL TR=1E-06 (mg/kg)	Dermal SL TR=1E-06 (mg/kg)	Inhalation SL TR=1E-06 (mg/kg)	Carcinogenic SL TR=1E-06 (mg/kg)	Ingestion SL THQ=1 (mg/kg)	Dermal SL THQ=1 (mg/kg)	Inhalation SL THQ=1 (mg/kg)	Noncarcinogenic SL THI=1 (mg/kg)
				2.0E-02	P						1.4E+09		1	0.1	Guanidine Chloride	50-01-1					2.3E+04	5.5E+04		1.6E+04
				3.0E-02	X						1.4E+09		1	0.1	Guanidine Nitrate	506-93-4					3.5E+04	8.3E+04		2.5E+04
				5.0E-05	I						1.4E+09		1	0.1	Haloxyfop, Methyl	69806-40-2					5.8E+01	1.4E+02		4.1E+01
4.5E+00	I	1.3E-03	I	5.0E-04	I			V			1.4E+09	4.8E+05	1		Heptachlor	76-44-8	7.3E-01		4.5E+00	6.3E-01	5.8E+02			5.8E+02
9.1E+00	I	2.6E-03	I	1.3E-05	I			V			1.4E+09	8.4E+05	1		Heptachlor Epoxide	1024-57-3	3.6E-01		4.0E+00	3.3E-01	1.5E+01			1.5E+01
						3.0E-03	X	V		2.1E+02	1.4E+09	7.8E+03	1		Heptanal, n-	111-71-7							1.0E+02	1.0E+02
				3.0E-04	X	4.0E-01	P	V		5.8E+01	1.4E+09	8.9E+02	1		Heptane, N-	142-82-5					3.5E+02		1.6E+03	2.9E+02
				2.0E-03	I			V			1.4E+09	3.8E+05	1		Hexabromobenzene	87-82-1					2.3E+03			2.3E+03
				2.0E-04	I						1.4E+09		1	0.1	Hexabromodiphenyl ether, 2,2',4,4',5,5'- (BDE-153)	68631-49-2					2.3E+02	5.5E+02		1.6E+02
1.6E+00	I	4.6E-04	I	8.0E-04	I			V			1.4E+09	6.8E+04	1		Hexachlorobenzene	118-74-1	2.0E+00		1.8E+00	9.6E-01	9.3E+02			9.3E+02
7.8E-02	I	2.2E-05	I	1.0E-03	P			V		1.7E+01	1.4E+09	1.1E+04	1		Hexachlorobutadiene	87-68-3	4.2E+01		6.0E+00	5.3E+00	1.2E+03			1.2E+03
6.3E+00	I	1.8E-03	I	8.0E-03	A						1.4E+09		1	0.1	Hexachlorocyclohexane, Alpha-	319-84-6	5.2E-01	1.2E+00	9.3E+03	3.6E-01	9.3E+03	2.2E+04		6.6E+03
1.8E+00	I	5.3E-04	I								1.4E+09		1	0.1	Hexachlorocyclohexane, Beta-	319-85-7	1.8E+00	4.3E+00	3.1E+04	1.3E+00				
1.1E+00	C	3.1E-04	C	3.0E-04	I						1.4E+09		1	0.04	Hexachlorocyclohexane, Gamma- (Lindane)	58-89-9	3.0E+00	1.8E+01	5.4E+04	2.5E+00	3.5E+02	2.1E+03		3.0E+02
1.8E+00	I	5.1E-04	I								1.4E+09		1	0.1	Hexachlorocyclohexane, Technical	608-73-1	1.8E+00	4.3E+00	3.3E+04	1.3E+00				
				6.0E-03	I	2.0E-04	I	V		1.6E+01	1.4E+09	8.5E+03	1		Hexachlorocyclopentadiene	77-47-4					7.0E+03		7.5E+00	7.5E+00
4.0E-02	I	1.1E-05	C	7.0E-04	I	3.0E-02	I	V			1.4E+09	8.0E+03	1		Hexachloroethane	67-72-1	8.2E+01		8.9E+00	8.0E+00	8.2E+02		1.1E+03	4.6E+02
				3.0E-04	I						1.4E+09		1	0.1	Hexachlorophene	70-30-4					3.5E+02	8.3E+02		2.5E+02
1.1E-01	I			3.0E-03	I						1.4E+09		1	0.015	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	121-82-4	3.0E+01	4.7E+02		2.8E+01	3.5E+03	5.5E+04		3.3E+03
						1.0E-05	I	V		3.4E+03	1.4E+09	3.0E+05	1		Hexamethylene Diisocyanate, 1,6-	822-06-0							1.3E+01	1.3E+01
				4.0E-04	P						1.4E+09		1	0.1	Hexamethylphosphoramide	680-31-9					4.7E+02	1.1E+03		3.3E+02
						7.0E-01	I	V		1.4E+02	1.4E+09	8.3E+02	1		Hexane, N-	110-54-3							2.5E+03	2.5E+03
				2.0E+00	P						1.4E+09		1	0.1	Hexanedioic Acid	124-04-9					2.3E+06	5.5E+06		1.6E+06
				5.0E-03	I	3.0E-02	I	V		3.3E+03	1.4E+09	1.3E+04	1		Hexanone, 2-	591-78-6					5.8E+03		1.7E+03	1.3E+03
				3.3E-02	I						1.4E+09		1	0.1	Hexazinone	51235-04-2					3.9E+04	9.1E+04		2.7E+04
				2.5E-02	I						1.4E+09		1	0.1	Hexythiazox	78587-05-0					2.9E+04	6.9E+04		2.1E+04
				1.7E-02	O						1.4E+09		1	0.1	Hydramethylnon	67485-29-4					2.0E+04	4.7E+04		1.4E+04
3.0E+00	I	4.9E-03	I			3.0E-05	P	V			1.4E+09		1		Hydrazine	302-01-2	1.1E+00		3.4E+03	1.1E+00			1.8E+05	1.8E+05
3.0E+00	I	4.9E-03	I								1.4E+09		1		Hydrazine Sulfate	10034-93-2	1.1E+00		3.4E+03	1.1E+00				
						2.0E-02	I	V			1.4E+09		1		Hydrogen Chloride	7647-01-0							1.2E+08	1.2E+08
				4.0E-02	C	1.4E-02	C	V			1.4E+09		1		Hydrogen Fluoride	7664-39-3					4.7E+04		8.3E+07	4.7E+04
						2.0E-03	I	V			1.4E+09		1		Hydrogen Sulfide	7783-06-4							1.2E+07	1.2E+07
6.0E-02	P			4.0E-02	P						1.4E+09		1	0.1	Hydroquinone	123-31-9	5.5E+01	1.3E+02		3.8E+01	4.7E+04	1.1E+05		3.3E+04
6.1E-02	O			2.5E-03	O						1.4E+09		1	0.1	Imazalil	35554-44-0	5.4E+01	1.3E+02		3.8E+01	2.9E+03	6.9E+03		2.1E+03
				2.5E-01	I						1.4E+09		1	0.1	Imazaquin	81335-37-7					2.9E+05	6.9E+05		2.1E+05
				2.5E+00	O						1.4E+09		1	0.1	Imazethapyr	81335-77-5					2.9E+06	6.9E+06		2.1E+06
				1.0E-02	A						1.4E+09		1		Iodine	7553-56-2					1.2E+04			1.2E+04
				4.0E-02	I						1.4E+09		1	0.1	Iprodione	36734-19-7					4.7E+04	1.1E+05		3.3E+04
				7.0E-01	P						1.4E+09		1		Iron	7439-89-6					8.2E+05			8.2E+05
				3.0E-01	I			V		1.0E+04	1.4E+09	2.8E+04	1		Isobutyl Alcohol	78-83-1					3.5E+05			3.5E+05
9.5E-04	I			2.0E-01	I	2.0E+00	C				1.4E+09		1	0.1	Isophorone	78-59-1	3.4E+03	8.1E+03		2.4E+03	2.3E+05	5.5E+05	1.2E+10	1.6E+05
				1.5E-02	I			V			1.4E+09	4.2E+05	1		Isopropalin	33820-53-0					1.8E+04			1.8E+04
				2.0E+00	P	2.0E-01	P	V		1.1E+05	1.4E+09	2.8E+04	1		Isopropanol	67-63-0					2.3E+06		2.4E+04	2.4E+04
				1.0E-01	I						1.4E+09		1	0.1	Isopropyl Methyl Phosphonic Acid	1832-54-8					1.2E+05	2.8E+05		8.2E+04
				5.0E-02	I						1.4E+09		1	0.1	Isoxaben	82558-50-7					5.8E+04	1.4E+05		4.1E+04
						3.0E-01	A	V			1.4E+09		1		JP-7	E1737665							1.8E+09	1.8E+09
				8.0E-03	O						1.4E+09		1	0.1	Lactofen	77501-63-4					9.3E+03	2.2E+04		6.6E+03
				2.0E-04	X						1.4E+09		1	0.1	Lactonitrile	78-97-7					2.3E+02	5.5E+02		1.6E+02
															Lead Compounds									
8.5E-03	C	1.2E-05	C								1.4E+09		1		~Lead Phosphate	7446-27-7	3.8E+02		1.4E+06	3.8E+02				
8.5E-03	C	1.2E-05	C								1.4E+09		1	0.1	~Lead acetate	301-04-2	3.8E+02	9.1E+02	1.4E+06	2.7E+02				
											1.4E+09		1		~Lead and Compounds	7439-92-1								8.0E+02
8.5E-03	C	1.2E-05	C								1.4E+09		1	0.1	~Lead subacetate	1335-32-6	3.8E+02	9.1E+02	1.4E+06	2.7E+02				
				1.0E-07	I			V		2.4E+00	1.4E+09	1.9E+03	1		~Tetraethyl Lead	78-00-2					1.2E-01			1.2E-01
				5.0E-06	P			V		3.8E+02	1.4E+09	2.6E+04	1		Lewisite	541-25-3					5.8E+00			5.8E+00
				7.7E-03	O						1.4E+09		1	0.1	Linuron	330-55-2					9.0E+03	2.1E+04		6.3E+03
				2.0E-03	P						1.4E+09		1		Lithium	7439-93-2					2.3E+03			2.3E+03
				5.0E-04	I						1.4E+09		1	0.1	MCPA	94-74-6					5.8E+02	1.4E+03		4.1E+02
				4.4E-03	O						1.4E+09		1	0.1	MCPB	94-81-5					5.1E+03	1.2E+04		3.6E+03
				1.0E-03	I						1.4E+09		1	0.1	MCPP	93-65-2					1.2E+03	2.8E+03		8.2E+02
				2.0E-02	I						1.4E+09		1	0.1	Malathion	121-75-5					2.3E+04	5.5E+04		1.6E+04
				1.0E-01	I	7.0E-04	C				1.4E+09		1	0.1	Maleic Anhydride	108-31-6					1.2E+05	2.8E+05	4.2E+06	8.0E+04
				5.0E-01	I						1.4E+09		1	0.1	Maleic Hydrazide	123-33-1					5.8E+05	1.4E+06		4.1E+05
				1.0E-04	P						1.4E+09		1	0.1	Malononitrile	109-77-3					1.2E+02	2.8E+02		8.2E+01
				3.0E-02	H						1.4E+09		1	0.1	Mancozeb	8018-01-7					3.5E+04	8.3E+04		2.5E+04
				5.0E-03	I						1.4E+09		1	0.1	Maneb	12427-38-2					5.8E+03	1.4E+04		4.1E+03
				1.4E-01	I	5.0E-05	I						1		Manganese (Diet)	7439-96-5								
				2.4E-02	S	5.0E-05	I				1.4E+09		0.04		Manganese (Non-diet)	7439-96-5					2.8E+04		3.0E+05	2.6E+04
				9.0E-05	H						1.4E+09		1	0.1	Mephosfolan	950-10-7					1.1E+02	2.5E+02		7.4E+01
				3.0E-02	I						1.4E+09		1	0.1	Mepiquat Chloride	24307-26-4					3.5E+04	8.3E+04		2.5E+04

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Toxicity and Chemical-specific Information														Contaminant		Carcinogenic Target Risk (TR) = 1E-06				Noncancer Hazard Index (HI) = 1			
SFO $(mg/kg\text{-}day)^{-1}$	key	IUR $(ug/m^3)^{-1}$	key	RfD_o (mg/kg-day)	key	RfC_i (mg/m^3)	key	vol	muta-gen	C_{sat} (mg/kg)	PEF (m^3/kg)	VF (m^3/kg)	GIABS	ABS	Analyte	CAS No.	Ingestion SL TR=1E-06 (mg/kg)	Dermal SL TR=1E-06 (mg/kg)	Inhalation SL TR=1E-06 (mg/kg)	Carcinogenic SL TR=1E-06 (mg/kg)	Ingestion SL THQ=1 (mg/kg)	Dermal SL THQ=1 (mg/kg)	Inhalation SL THQ=1 (mg/kg)	Noncarcinogenic SL THI=1 (mg/kg)
1.1E-02	P			4.0E-03	P						1.4E+09		1	0.1	Mercaptobenzothiazole, 2-	149-30-4	3.0E+02	7.0E+02		2.1E+02	4.7E+03	1.1E+04		3.3E+03
															Mercury Compounds									
				3.0E-04	I	3.0E-04	S				1.4E+09		0.07		~Mercuric Chloride (and other Mercury salts)	7487-94-7					3.5E+02		1.8E+06	3.5E+02
						3.0E-04	I	V		3.1E+00	1.4E+09	3.5E+04	1		~Mercury (elemental)	7439-97-6							4.6E+01	4.6E+01
				1.0E-04	I						1.4E+09		1		~Methyl Mercury	22967-92-6					1.2E+02			1.2E+02
				8.0E-05	I						1.4E+09		1	0.1	~Phenylmercuric Acetate	62-38-4					9.3E+01	2.2E+02		6.6E+01
				3.0E-05	I			V			1.4E+09	1.9E+06	1		Merphos	150-50-5					3.5E+01			3.5E+01
				1.0E-04	O						1.4E+09		1	0.1	Merphos Oxide	78-48-8					1.2E+02	2.8E+02		8.2E+01
				6.0E-02	I						1.4E+09		1	0.1	Metalaxyl	57837-19-1					7.0E+04	1.7E+05		4.9E+04
				1.0E-04	I	3.0E-02	P	V		4.6E+03	1.4E+09	6.8E+03	1		Methacrylonitrile	126-98-7					1.2E+02		8.9E+02	1.0E+02
				5.0E-05	I						1.4E+09		1	0.1	Methamidophos	10265-92-6					5.8E+01	1.4E+02		4.1E+01
				2.0E+00	I	2.0E+01	I	V		1.1E+05	1.4E+09	2.9E+04	1		Methanol	67-56-1					2.3E+06		2.5E+06	1.2E+06
				1.5E-03	O						1.4E+09		1	0.1	Methidathion	950-37-8					1.8E+03	4.1E+03		1.2E+03
				2.5E-02	I						1.4E+09		1	0.1	Methomyl	16752-77-5					2.9E+04	6.9E+04		2.1E+04
4.9E-02	C	1.4E-05	C								1.4E+09		1	0.1	Methoxy-5-nitroaniline, 2-	99-59-2	6.7E+01	1.6E+02	1.2E+06	4.7E+01				
				5.0E-03	I						1.4E+09		1	0.1	Methoxychlor	72-43-5					5.8E+03	1.4E+04		4.1E+03
				8.0E-03	P	1.0E-03	P	V		1.2E+05	1.4E+09	1.2E+05	1		Methoxyethanol Acetate, 2-	110-49-6					9.3E+03		5.4E+02	5.1E+02
				5.0E-03	P	2.0E-02	I	V		1.1E+05	1.4E+09	1.0E+05	1		Methoxyethanol, 2-	109-86-4					5.8E+03		8.8E+03	3.5E+03
				1.0E+00	X			V		2.9E+04	1.4E+09	8.1E+03	1		Methyl Acetate	79-20-9					1.2E+06			1.2E+06
						2.0E-02	P	V		6.8E+03	1.4E+09	7.0E+03	1		Methyl Acrylate	96-33-3							6.1E+02	6.1E+02
				6.0E-01	I	5.0E+00	I	V		2.8E+04	1.4E+09	1.2E+04	1		Methyl Ethyl Ketone (2-Butanone)	78-93-3					7.0E+05		2.7E+05	1.9E+05
		1.0E-03	X	1.0E-03	P	2.0E-05	X	V		1.8E+05	1.4E+09	5.0E+04	1		Methyl Hydrazine	60-34-4			6.2E-01	6.2E-01	1.2E+03		4.4E+00	4.4E+00
						3.0E+00	I	V		3.4E+03	1.4E+09	1.1E+04	1		Methyl Isobutyl Ketone (4-methyl-2-pentanone)	108-10-1							1.4E+05	1.4E+05
						1.0E-03	C	V		1.0E+04	1.4E+09	4.4E+03	1		Methyl Isocyanate	624-83-9							1.9E+01	1.9E+01
				1.4E+00	I	7.0E-01	I	V		2.4E+03	1.4E+09	6.3E+03	1		Methyl Methacrylate	80-62-6					1.6E+06		1.9E+04	1.9E+04
				2.5E-04	I						1.4E+09		1	0.1	Methyl Parathion	298-00-0					2.9E+02	6.9E+02		2.1E+02
				6.0E-02	X						1.4E+09		1	0.1	Methyl Phosphonic Acid	993-13-5					7.0E+04	1.7E+05		4.9E+04
				6.0E-03	H	4.0E-02	H	V		3.9E+02	1.4E+09	2.4E+04	1		Methyl Styrene (Mixed Isomers)	25013-15-4					7.0E+03		4.3E+03	2.6E+03
9.9E-02	C	2.8E-05	C								1.4E+09		1	0.1	Methyl methanesulfonate	66-27-3	3.3E+01	7.8E+01	6.0E+05	2.3E+01				
1.8E-03	C	2.6E-07	C			3.0E+00	I	V		8.9E+03	1.4E+09	4.9E+03	1		Methyl tert-Butyl Ether (MTBE)	1634-04-4	1.8E+03		2.3E+02	2.1E+02			6.4E+04	6.4E+04
				3.0E-04	X						1.4E+09		1	0.1	Methyl-1,4-benzenediamine dihydrochloride, 2-	615-45-2					3.5E+02	8.3E+02		2.5E+02
						3.0E+00	X	V		2.5E+03	1.4E+09	1.7E+04	1		Methyl-2-Pentanol, 4-	108-11-2							2.3E+05	2.3E+05
9.0E-03	P			2.0E-02	X						1.4E+09		1	0.1	Methyl-5-Nitroaniline, 2-	99-55-8	3.6E+02	8.6E+02		2.6E+02	2.3E+04	5.5E+04		1.6E+04
8.3E+00	C	2.4E-03	C								1.4E+09		1	0.1	Methyl-N-nitro-N-nitrosoguanidine, N-	70-25-7	3.9E-01	9.3E-01	6.9E+03	2.8E-01				
1.3E-01	C	3.7E-05	C								1.4E+09		1	0.1	Methylaniline Hydrochloride, 2-	636-21-5	2.5E+01	5.9E+01	4.5E+05	1.8E+01				
				1.0E-02	A						1.4E+09		1	0.1	Methylarsonic acid	124-58-3					1.2E+04	2.8E+04		8.2E+03
				2.0E-04	X						1.4E+09		1	0.1	Methylbenzene,1-4-diamine monohydrochloride, 2-	74612-12-7					2.3E+02	5.5E+02		1.6E+02
1.0E-01	X			3.0E-04	X						1.4E+09		1	0.1	Methylbenzene-1,4-diamine sulfate, 2-	615-50-9	3.3E+01	7.7E+01		2.3E+01	3.5E+02	8.3E+02		2.5E+02
2.2E+01	C	6.3E-03	C						M		1.4E+09		1	0.1	Methylcholanthrene, 3-	56-49-5	1.5E-01	3.5E-01	2.6E+03	1.0E-01				
2.0E-03	I	1.0E-08	I	6.0E-03	I	6.0E-01	I	V	M	3.3E+03	1.4E+09	2.2E+03	1		Methylene Chloride	75-09-2	1.6E+03		2.7E+03	1.0E+03	7.0E+03		5.8E+03	3.2E+03
1.0E-01	P	4.3E-04	C	2.0E-03	P				M		1.4E+09		1	0.1	Methylene-bis(2-chloroaniline), 4,4'-	101-14-4	3.3E+01	7.7E+01	3.9E+04	2.3E+01	2.3E+03	5.5E+03		1.6E+03
4.6E-02	I	1.3E-05	C								1.4E+09		1	0.1	Methylene-bis(N,N-dimethyl) Aniline, 4,4'-	101-61-1	7.1E+01	1.7E+02	1.3E+06	5.0E+01				
1.6E+00	C	4.6E-04	C			2.0E-02	C				1.4E+09		1	0.1	Methylenebisbenzenamine, 4,4'-	101-77-9	2.0E+00	4.8E+00	3.6E+04	1.4E+00			1.2E+08	1.2E+08
						6.0E-04	I				1.4E+09		1	0.1	Methylenediphenyl Diisocyanate	101-68-8							3.6E+06	3.6E+06
				7.0E-02	H			V		5.0E+02	1.4E+09	1.3E+04	1		Methylstyrene, Alpha-	98-83-9					8.2E+04			8.2E+04
				1.5E-01	I						1.4E+09		1	0.1	Metolachlor	51218-45-2					1.8E+05	4.1E+05		1.2E+05
				2.5E-02	I						1.4E+09		1	0.1	Metribuzin	21087-64-9					2.9E+04	6.9E+04		2.1E+04
				2.5E-01	I						1.4E+09		1	0.1	Metsulfuron-methyl	74223-64-6					2.9E+05	6.9E+05		2.1E+05
				3.0E+00	P			V		3.4E-01	1.4E+09	1.4E+03	1		Mineral oils	8012-95-1					3.5E+06			3.5E+06
1.8E+01	C	5.1E-03	C	2.0E-04	I			V			1.4E+09	8.6E+05	1		Mirex	2385-85-5	1.8E-01		2.1E+00	1.7E-01	2.3E+02			2.3E+02
				2.0E-03	I						1.4E+09		1	0.1	Molinate	2212-67-1					2.3E+03	5.5E+03		1.6E+03
				5.0E-03	I						1.4E+09		1		Molybdenum	7439-98-7					5.8E+03			5.8E+03
				1.0E-01	I						1.4E+09		1		Monochloramine	10599-90-3					1.2E+05			1.2E+05
				2.0E-03	P						1.4E+09		1	0.1	Monomethylaniline	100-61-8					2.3E+03	5.5E+03		1.6E+03
				2.5E-02	I						1.4E+09		1	0.1	Myclobutanil	88671-89-0					2.9E+04	6.9E+04		2.1E+04
				3.0E-04	X						1.4E+09		1	0.1	N,N'-Diphenyl-1,4-benzenediamine	74-31-7					3.5E+02	8.3E+02		2.5E+02
				2.0E-03	I			V			1.4E+09	5.7E+04	1		Naled	300-76-5					2.3E+03			2.3E+03
				3.0E-02	X	1.0E-01	P	V			1.4E+09		1		Naphtha, High Flash Aromatic (HFAN)	64742-95-6					3.5E+04		6.0E+08	3.5E+04
1.8E+00	C	0.0E+00	C								1.4E+09		1	0.1	Naphthylamine, 2-	91-59-8	1.8E+00	4.3E+00		1.3E+00				
				1.2E-01	O						1.4E+09		1	0.1	Napropamide	15299-99-7					1.4E+05	3.3E+05		9.8E+04
		2.6E-04	C	1.1E-02	C	1.4E-05	C				1.4E+09		1	0.1	Nickel Acetate	373-02-4			6.4E+04	6.4E+04	1.3E+04	3.0E+04	8.3E+04	8.1E+03
		2.6E-04	C	1.1E-02	C	1.4E-05	C				1.4E+09		1	0.1	Nickel Carbonate	3333-67-3			6.4E+04	6.4E+04	1.3E+04	3.0E+04	8.3E+04	8.1E+03
		2.6E-04	C	1.1E-02	C	1.4E-05	C	V			1.4E+09		1		Nickel Carbonyl	13463-39-3			6.4E+04	6.4E+04	1.3E+04		8.3E+04	1.1E+04
		2.6E-04	C	1.1E-02	C	1.4E-05	C				1.4E+09		0.04		Nickel Hydroxide	12054-48-7			6.4E+04	6.4E+04	1.3E+04		8.3E+04	1.1E+04
		2.6E-04	C	1.1E-02	C	2.0E-05	C				1.4E+09		0.04		Nickel Oxide	1313-99-1			6.4E+04	6.4E+04	1.3E+04		1.2E+05	1.2E+04
		2.4E-04	I	1.1E-02	C	1.4E-05	C				1.4E+09		0.04		Nickel Refinery Dust	E715532			6.9E+04	6.9E+04	1.3E+04		8.3E+04	1.1E+04
		2.6E-04	C	2.0E-02	I	9.0E-05	A				1.4E+09		0.04		Nickel Soluble Salts	7440-02-0			6.4E+04	6.4E+04	2.3E+04		5.4E+05	2.2E+04
1.7E+00	C	4.8E-04	I	1.1E-02	C	1.4E-05	C				1.4E+09		0.04		Nickel Subsulfide	12035-72-2	1.9E+00		3.5E+04	1.9E+00	1.3E+04		8.3E+04	1.1E+04
		2.6E-04	C	1.1E-02	C	1.4E-05	C				1.4E+09		1	0.1	Nickelocene	1271-28-9			6.4E+04	6.4E+04	1.3E+04	3.0E+04	8.3E+04	8.1E+03
				1.6E+00	I						1.4E+09		1		Nitrate	14797-55-8					1.9E+06			1.9E+06

Key: I = IRIS; P = PPRTV; D = DWSHA; O = OPP; A = ATSDR; C = Cal EPA; X = APPENDIX PPRTV SCREEN (See FAQ #29); H = HEAST; F = See FAQ; E = see user guide Section 2.3.5; W = see user guide Section 2.3.6; L = see user guide on lead; M = mutagen; S = see user guide Section 5; V = volatile; R = RBA applied (See User Guide for Arsenic notice) ; c = cancer; n = noncancer; * = where: n SL < 100X c SL; ** = where n SL < 10X c SL; SSL values are based on DAF=1; m = Concentration may exceed ceiling limit (See User Guide); s = Concentration may exceed Csat (See User Guide)

Toxicity and Chemical-specific Information														Contaminant		Carcinogenic Target Risk (TR) = 1E-06				Noncancer Hazard Index (HI) = 1			
SFO $(mg/kg\text{-}day)^{-1}$	key	IUR $(ug/m^3)^{-1}$	key	RfD_o (mg/kg-day)	key	RfC_i (mg/m^3)	key	vol	muta-gen	C_{sat} (mg/kg)	PEF (m^3/kg)	VF (m^3/kg)	GIABS	ABS	Analyte	CAS No.	Ingestion SL TR=1E-06 (mg/kg)	Dermal SL TR=1E-06 (mg/kg)	Inhalation SL TR=1E-06 (mg/kg)	Carcinogenic SL TR=1E-06 (mg/kg)	Ingestion SL THQ=1 (mg/kg)	Dermal SL THQ=1 (mg/kg)	Inhalation SL THQ=1 (mg/kg)	Noncarcinogenic SL THI=1 (mg/kg)
											1.4E+09		1		Nitrate + Nitrite (as N)	E701177								
				1.0E-01	I						1.4E+09		1		Nitrite	14797-65-0					1.2E+05			1.2E+05
				1.0E-02	X	5.0E-05	X				1.4E+09		1	0.1	Nitroaniline, 2-	88-74-4					1.2E+04	2.8E+04	3.0E+05	8.0E+03
2.0E-02	P			4.0E-03	P	6.0E-03	P				1.4E+09		1	0.1	Nitroaniline, 4-	100-01-6	1.6E+02	3.9E+02		1.1E+02	4.7E+03	1.1E+04	3.6E+07	3.3E+03
		4.0E-05	I	2.0E-03	I	9.0E-03	I	V		3.1E+03	1.4E+09	7.3E+04	1		Nitrobenzene	98-95-3			2.2E+01	2.2E+01	2.3E+03		2.9E+03	1.3E+03
				3.0E+03	P						1.4E+09		1	0.1	Nitrocellulose	9004-70-0					3.5E+09	8.3E+09		2.5E+09
				7.0E-02	H						1.4E+09		1	0.1	Nitrofurantoin	67-20-9					8.2E+04	1.9E+05		5.7E+04
1.3E+00	C	3.7E-04	C								1.4E+09		1	0.1	Nitrofurazone	59-87-0	2.5E+00	5.9E+00	4.5E+04	1.8E+00				
1.7E-02	P			1.0E-04	P						1.4E+09		1	0.1	Nitroglycerin	55-63-0	1.9E+02	4.5E+02		1.4E+02	1.2E+02	2.8E+02		8.2E+01
				1.0E-01	I						1.4E+09		1	0.1	Nitroguanidine	556-88-7					1.2E+05	2.8E+05		8.2E+04
		8.8E-06	P			5.0E-03	P	V		1.8E+04	1.4E+09	1.7E+04	1		Nitromethane	75-52-5			2.4E+01	2.4E+01			3.7E+02	3.7E+02
		2.7E-03	H			2.0E-02	I	V		4.9E+03	1.4E+09	1.3E+04	1		Nitropropane, 2-	79-46-9			6.0E-02	6.0E-02			1.2E+03	1.2E+03
2.7E+01	C	7.7E-03	C						M		1.4E+09		1	0.1	Nitroso-N-ethylurea, N-	759-73-9	1.2E-01	2.9E-01	2.2E+03	8.5E-02				
1.2E+02	C	3.4E-02	C						M		1.4E+09		1	0.1	Nitroso-N-methylurea, N-	684-93-5	2.7E-02	6.4E-02	4.9E+02	1.9E-02				
5.4E+00	I	1.6E-03	I					V			1.4E+09	2.4E+05	1		Nitroso-di-N-butylamine, N-	924-16-3	6.1E-01		1.9E+00	4.6E-01				
7.0E+00	I	2.0E-03	C								1.4E+09		1	0.1	Nitroso-di-N-propylamine, N-	621-64-7	4.7E-01	1.1E+00	8.3E+03	3.3E-01				
2.8E+00	I	8.0E-04	C								1.4E+09		1	0.1	Nitrosodiethanolamine, N-	1116-54-7	1.2E+00	2.8E+00	2.1E+04	8.2E-01				
1.5E+02	I	4.3E-02	I						M		1.4E+09		1	0.1	Nitrosodiethylamine, N-	55-18-5	2.2E-02	5.2E-02	3.9E+02	1.5E-02				
5.1E+01	I	1.4E-02	I	8.0E-06	P	4.0E-05	X	V	M	2.4E+05	1.4E+09	8.2E+04	1		Nitrosodimethylamine, N-	62-75-9	6.4E-02		7.2E-02	3.4E-02	9.3E+00		1.4E+01	5.7E+00
4.9E-03	I	2.6E-06	C								1.4E+09		1	0.1	Nitrosodiphenylamine, N-	86-30-6	6.7E+02	1.6E+03	6.4E+06	4.7E+02				
2.2E+01	I	6.3E-03	C					V		1.1E+05	1.4E+09	1.2E+05	1		Nitrosomethylethylamine, N-	10595-95-6	1.5E-01		2.4E-01	9.1E-02				
6.7E+00	C	1.9E-03	C								1.4E+09		1	0.1	Nitrosomorpholine [N-]	59-89-2	4.9E-01	1.2E+00	8.8E+03	3.4E-01				
9.4E+00	C	2.7E-03	C								1.4E+09		1	0.1	Nitrosopiperidine [N-]	100-75-4	3.5E-01	8.2E-01	6.2E+03	2.4E-01				
2.1E+00	I	6.1E-04	I								1.4E+09		1	0.1	Nitrosopyrrolidine, N-	930-55-2	1.6E+00	3.7E+00	2.7E+04	1.1E+00				
				1.0E-04	X						1.4E+09		1	0.1	Nitrotoluene, m-	99-08-1					1.2E+02	2.8E+02		8.2E+01
2.2E-01	P			9.0E-04	P			V		1.5E+03	1.4E+09	1.4E+05	1		Nitrotoluene, o-	88-72-2	1.5E+01			1.5E+01	1.1E+03			1.1E+03
1.6E-02	P			4.0E-03	P						1.4E+09		1	0.1	Nitrotoluene, p-	99-99-0	2.0E+02	4.8E+02		1.4E+02	4.7E+03	1.1E+04		3.3E+03
				3.0E-04	X	2.0E-02	P	V		6.9E+00	1.4E+09	1.0E+03	1		Nonane, n-	111-84-2					3.5E+02		9.1E+01	7.2E+01
				1.5E-02	O						1.4E+09		1	0.1	Norflurazon	27314-13-2					1.8E+04	4.1E+04		1.2E+04
				3.0E-03	I						1.4E+09		1	0.1	Octabromodiphenyl Ether	32536-52-0					3.5E+03	8.3E+03		2.5E+03
				5.0E-02	I						1.4E+09		1	0.006	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX)	2691-41-0					5.8E+04	2.3E+06		5.7E+04
				2.0E-03	H						1.4E+09		1	0.1	Octamethylpyrophosphoramide	152-16-9					2.3E+03	5.5E+03		1.6E+03
7.8E-03	O			1.4E-01	O						1.4E+09		1	0.1	Oryzalin	19044-88-3	4.2E+02	9.9E+02		2.9E+02	1.6E+05	3.9E+05		1.1E+05
				5.0E-03	I						1.4E+09		1	0.1	Oxadiazon	19666-30-9					5.8E+03	1.4E+04		4.1E+03
				2.5E-02	I						1.4E+09		1	0.1	Oxamyl	23135-22-0					2.9E+04	6.9E+04		2.1E+04
7.3E-02	O			3.0E-02	O						1.4E+09		1	0.1	Oxyfluorfen	42874-03-3	4.5E+01	1.1E+02		3.1E+01	3.5E+04	8.3E+04		2.5E+04
				1.3E-02	I						1.4E+09		1	0.1	Paclobutrazol	76738-62-0					1.5E+04	3.6E+04		1.1E+04
				4.5E-03	I						1.4E+09		1	0.1	Paraquat Dichloride	1910-42-5					5.3E+03	1.2E+04		3.7E+03
				6.0E-03	H						1.4E+09		1	0.1	Parathion	56-38-2					7.0E+03	1.7E+04		4.9E+03
				5.0E-02	H			V			1.4E+09	4.5E+04	1		Pebulate	1114-71-2					5.8E+04			5.8E+04
				3.0E-02	O						1.4E+09		1	0.1	Pendimethalin	40487-42-1					3.5E+04	8.3E+04		2.5E+04
				2.0E-03	I			V		3.1E-01	1.4E+09	5.1E+05	1		Pentabromodiphenyl Ether	32534-81-9					2.3E+03			2.3E+03
				1.0E-04	I						1.4E+09		1	0.1	Pentabromodiphenyl ether, 2,2',4,4',5- (BDE-99)	60348-60-9					1.2E+02	2.8E+02		8.2E+01
				8.0E-04	I			V			1.4E+09	8.1E+04	1		Pentachlorobenzene	608-93-5					9.3E+02			9.3E+02
9.0E-02	P							V		4.6E+02	1.4E+09	9.6E+03	1		Pentachloroethane	76-01-7	3.6E+01			3.6E+01				
2.6E-01	H			3.0E-03	I			V			1.4E+09	4.3E+05	1		Pentachloronitrobenzene	82-68-8	1.3E+01			1.3E+01	3.5E+03			3.5E+03
4.0E-01	I	5.1E-06	C	5.0E-03	I						1.4E+09		1	0.25	Pentachlorophenol	87-86-5	8.2E+00	7.7E+00	3.3E+06	4.0E+00	5.8E+03	5.5E+03		2.8E+03
4.0E-03	X			2.0E-03	P						1.4E+09		1	0.1	Pentaerythritol tetranitrate (PETN)	78-11-5	8.2E+02	1.9E+03		5.7E+02	2.3E+03	5.5E+03		1.6E+03
						1.0E+00	P	V		3.9E+02	1.4E+09	7.8E+02	1		Pentane, n-	109-66-0							3.4E+03	3.4E+03
															Perchlorates									
				7.0E-04	I						1.4E+09		1		~Ammonium Perchlorate	7790-98-9					8.2E+02			8.2E+02
				7.0E-04	I						1.4E+09		1		~Lithium Perchlorate	7791-03-9					8.2E+02			8.2E+02
				7.0E-04	I						1.4E+09		1		~Perchlorate and Perchlorate Salts	14797-73-0					8.2E+02			8.2E+02
				7.0E-04	I						1.4E+09		1		~Potassium Perchlorate	7778-74-7					8.2E+02			8.2E+02
				7.0E-04	I						1.4E+09		1		~Sodium Perchlorate	7601-89-0					8.2E+02			8.2E+02
				2.0E-02	P						1.4E+09		1	0.1	Perfluorobutane sulfonic acid (PFBS)	375-73-5					2.3E+04	5.5E+04		1.6E+04
				2.0E-02	P						1.4E+09		1	0.1	Perfluorobutanesulfonate	45187-15-3					2.3E+04	5.5E+04		1.6E+04
				5.0E-02	I						1.4E+09		1	0.1	Permethrin	52645-53-1					5.8E+04	1.4E+05		4.1E+04
2.2E-03	C	6.3E-07	C								1.4E+09		1	0.1	Phenacetin	62-44-2	1.5E+03	3.5E+03	2.6E+07	1.0E+03				
				2.4E-01	O						1.4E+09		1	0.1	Phenmedipham	13684-63-4					2.8E+05	6.6E+05		2.0E+05
				3.0E-01	I	2.0E-01	C				1.4E+09		1	0.1	Phenol	108-95-2					3.5E+05	8.3E+05	1.2E+09	2.5E+05
				4.0E-03	I						1.4E+09		1	0.1	Phenol, 2-(1-methylethoxy)-, methylcarbamate	114-26-1					4.7E+03	1.1E+04		3.3E+03
				5.0E-04	X						1.4E+09		1	0.1	Phenothiazine	92-84-2					5.8E+02	1.4E+03		4.1E+02
				2.0E-04	X			V		1.3E+02	1.4E+09	7.1E+03	1		Phenyl Isothiocyanate	103-72-0					2.3E+02			2.3E+02
				6.0E-03	I						1.4E+09		1	0.1	Phenylenediamine, m-	108-45-2					7.0E+03	1.7E+04		4.9E+03
1.2E-01	P			4.0E-03	P						1.4E+09		1	0.1	Phenylenediamine, o-	95-54-5	2.7E+01	6.4E+01		1.9E+01	4.7E+03	1.1E+04		3.3E+03
				1.0E-03	X						1.4E+09		1	0.1	Phenylenediamine, p-	106-50-3					1.2E+03	2.8E+03		8.2E+02
1.9E-03	H										1.4E+09		1	0.1	Phenylphenol, 2-	90-43-7	1.7E+03	4.0E+03		1.2E+03				
				2.0E-04	H						1.4E+09		1	0.1	Phorate	298-02-2					2.3E+02	5.5E+02		1.6E+02
						3.0E-04	I	V		1.6E+03	1.4E+09	9.8E+02	1		Phosgene	75-44-5							1.3E+00	1.3E+00

Key: I = IRIS; P = PPRTV; D = DWSHA; O = OPP; A = ATSDR; C = Cal EPA; X = APPENDIX PPRTV SCREEN (See FAQ #29); H = HEAST; F = See FAQ; E = see user guide Section 2.3.5; W = see user guide Section 2.3.6; L = see user guide on lead; M = mutagen; S = see user guide Section 5; V = volatile; R = RBA applied (See User Guide for Arsenic notice) ; c = cancer; n = noncancer; * = where: n SL < 100X c SL; ** = where n SL < 10X c SL; SSL values are based on DAF=1; m = Concentration may exceed ceiling limit (See User Guide); s = Concentration may exceed Csat (See User Guide)

Toxicity and Chemical-specific Information														Contaminant		Carcinogenic Target Risk (TR) = 1E-06				Noncancer Hazard Index (HI) = 1			
SFO (mg/kg-day)$^{-1}$	key	IUR (ug/m^3)$^{-1}$	key	RfD_o (mg/kg-day)	key	RfC_i (mg/m^3)	key	vol	muta-gen	C_{sat} (mg/kg)	PEF (m^3/kg)	VF (m^3/kg)	GIABS	ABS	Analyte	CAS No.	Ingestion SL TR=1E-06 (mg/kg)	Dermal SL TR=1E-06 (mg/kg)	Inhalation SL TR=1E-06 (mg/kg)	Carcinogenic SL TR=1E-06 (mg/kg)	Ingestion SL THQ=1 (mg/kg)	Dermal SL THQ=1 (mg/kg)	Inhalation SL THQ=1 (mg/kg)	Noncarcinogenic SL THI=1 (mg/kg)
				2.0E-02	I						1.4E+09		1	0.1	Phosmet	732-11-6					2.3E+04	5.5E+04		1.6E+04
															Phosphates, Inorganic									
				4.9E+01	P						1.4E+09		1		~Aluminum metaphosphate	13776-88-0					5.7E+07			5.7E+07
				4.9E+01	P						1.4E+09		1		~Ammonium polyphosphate	68333-79-9					5.7E+07			5.7E+07
				4.9E+01	P						1.4E+09		1		~Calcium pyrophosphate	7790-76-3					5.7E+07			5.7E+07
				4.9E+01	P						1.4E+09		1		~Diammonium phosphate	7783-28-0					5.7E+07			5.7E+07
				4.9E+01	P						1.4E+09		1		~Dicalcium phosphate	7757-93-9					5.7E+07			5.7E+07
				4.9E+01	P						1.4E+09		1		~Dimagnesium phosphate	7782-75-4					5.7E+07			5.7E+07
				4.9E+01	P						1.4E+09		1		~Dipotassium phosphate	7758-11-4					5.7E+07			5.7E+07
				4.9E+01	P						1.4E+09		1		~Disodium phosphate	7558-79-4					5.7E+07			5.7E+07
				4.9E+01	P						1.4E+09		1		~Monoaluminum phosphate	13530-50-2					5.7E+07			5.7E+07
				4.9E+01	P						1.4E+09		1		~Monoammonium phosphate	7722-76-1					5.7E+07			5.7E+07
				4.9E+01	P						1.4E+09		1		~Monocalcium phosphate	7758-23-8					5.7E+07			5.7E+07
				4.9E+01	P						1.4E+09		1		~Monomagnesium phosphate	7757-86-0					5.7E+07			5.7E+07
				4.9E+01	P						1.4E+09		1		~Monopotassium phosphate	7778-77-0					5.7E+07			5.7E+07
				4.9E+01	P						1.4E+09		1		~Monosodium phosphate	7558-80-7					5.7E+07			5.7E+07
				4.9E+01	P						1.4E+09		1		~Polyphosphoric acid	8017-16-1					5.7E+07			5.7E+07
				4.9E+01	P						1.4E+09		1		~Potassium tripolyphosphate	13845-36-8					5.7E+07			5.7E+07
				4.9E+01	P						1.4E+09		1		~Sodium acid pyrophosphate	7758-16-9					5.7E+07			5.7E+07
				4.9E+01	P						1.4E+09		1		~Sodium aluminum phosphate (acidic)	7785-88-8					5.7E+07			5.7E+07
				4.9E+01	P						1.4E+09		1		~Sodium aluminum phosphate (anhydrous)	10279-59-1					5.7E+07			5.7E+07
				4.9E+01	P						1.4E+09		1		~Sodium aluminum phosphate (tetrahydrate)	10305-76-7					5.7E+07			5.7E+07
				4.9E+01	P						1.4E+09		1		~Sodium hexametaphosphate	10124-56-8					5.7E+07			5.7E+07
				4.9E+01	P						1.4E+09		1		~Sodium polyphosphate	68915-31-1					5.7E+07			5.7E+07
				4.9E+01	P						1.4E+09		1		~Sodium trimetaphosphate	7785-84-4					5.7E+07			5.7E+07
				4.9E+01	P						1.4E+09		1		~Sodium tripolyphosphate	7758-29-4					5.7E+07			5.7E+07
				4.9E+01	P						1.4E+09		1		~Tetrapotassium phosphate	7320-34-5					5.7E+07			5.7E+07
				4.9E+01	P						1.4E+09		1		~Tetrasodium pyrophosphate	7722-88-5					5.7E+07			5.7E+07
				4.9E+01	P						1.4E+09		1		~Trialuminum sodium tetra decahydrogenoctaorthophosphate (dihydrate)	15136-87-5					5.7E+07			5.7E+07
				4.9E+01	P						1.4E+09		1		~Tricalcium phosphate	7758-87-4					5.7E+07			5.7E+07
				4.9E+01	P						1.4E+09		1		~Trimagnesium phosphate	7757-87-1					5.7E+07			5.7E+07
				4.9E+01	P						1.4E+09		1		~Tripotassium phosphate	7778-53-2					5.7E+07			5.7E+07
				4.9E+01	P						1.4E+09		1		~Trisodium phosphate	7601-54-9					5.7E+07			5.7E+07
				3.0E-04	I	3.0E-04	I	V			1.4E+09		1		Phosphine	7803-51-2					3.5E+02		1.8E+06	3.5E+02
				4.9E+01	P	1.0E-02	I				1.4E+09		1		Phosphoric Acid	7664-38-2					5.7E+07		6.0E+07	2.9E+07
				2.0E-05	I			V			1.4E+09	6.9E+03	1		Phosphorus, White	7723-14-0					2.3E+01			2.3E+01
															Phthalates									
1.4E-02	I	2.4E-06	C	2.0E-02	I						1.4E+09		1	0.1	~Bis(2-ethylhexyl)phthalate	117-81-7	2.3E+02	5.5E+02	6.9E+06	1.6E+02	2.3E+04	5.5E+04		1.6E+04
1.9E-03	P			2.0E-01	I						1.4E+09		1	0.1	~Butyl Benzyl Phthalate	85-68-7	1.7E+03	4.1E+03		1.2E+03	2.3E+05	5.5E+05		1.6E+05
				1.0E+00	I						1.4E+09		1	0.1	~Butylphthalyl Butylglycolate	85-70-1					1.2E+06	2.8E+06		8.2E+05
				1.0E-01	I						1.4E+09		1	0.1	~Dibutyl Phthalate	84-74-2					1.2E+05	2.8E+05		8.2E+04
				8.0E-01	I						1.4E+09		1	0.1	~Diethyl Phthalate	84-66-2					9.3E+05	2.2E+06		6.6E+05
				1.0E-01	I			V			1.4E+09	2.1E+04	1		~Dimethylterephthalate	120-61-6					1.2E+05			1.2E+05
				1.0E-02	P						1.4E+09		1	0.1	~Octyl Phthalate, di-N-	117-84-0					1.2E+04	2.8E+04		8.2E+03
				1.0E+00	H						1.4E+09		1	0.1	~Phthalic Acid, P-	100-21-0					1.2E+06	2.8E+06		8.2E+05
				2.0E+00	I	2.0E-02	C				1.4E+09		1	0.1	~Phthalic Anhydride	85-44-9					2.3E+06	5.5E+06	1.2E+08	1.6E+06
				7.0E-02	I						1.4E+09		1	0.1	Picloram	1918-02-1					8.2E+04	1.9E+05		5.7E+04
				1.0E-04	X						1.4E+09		1	0.1	Picramic Acid (2-Amino-4,6-dinitrophenol)	96-91-3					1.2E+02	2.8E+02		8.2E+01
				9.0E-04	X						1.4E+09		1	0.1	Picric Acid (2,4,6-Trinitrophenol)	88-89-1					1.1E+03	2.5E+03		7.4E+02
				6.7E-05	O						1.4E+09		1	0.1	Pirimiphos, Methyl	29232-93-7					7.8E+01	1.8E+02		5.5E+01
3.0E+01	C	8.6E-03	C	7.0E-06	H						1.4E+09		1	0.1	Polybrominated Biphenyls	59536-65-1	1.1E-01	2.6E-01	1.9E+03	7.7E-02	8.2E+00	1.9E+01		5.7E+00
															Polychlorinated Biphenyls (PCBs)									
7.0E-02	S	2.0E-05	S	7.0E-05	I			V			1.4E+09	7.1E+05	1	0.14	~Aroclor 1016	12674-11-2	4.7E+01	7.9E+01	4.4E+02	2.7E+01	8.2E+01	1.4E+02		5.1E+01
2.0E+00	S	5.7E-04	S					V			1.4E+09	2.0E+05	1	0.14	~Aroclor 1221	11104-28-2	1.6E+00	2.8E+00	4.4E+00	8.3E-01				
2.0E+00	S	5.7E-04	S					V			1.4E+09	1.1E+05	1	0.14	~Aroclor 1232	11141-16-5	1.6E+00	2.8E+00	2.4E+00	7.2E-01				
2.0E+00	S	5.7E-04	S					V			1.4E+09	5.9E+05	1	0.14	~Aroclor 1242	53469-21-9	1.6E+00	2.8E+00	1.3E+01	9.5E-01				
2.0E+00	S	5.7E-04	S					V			1.4E+09	6.3E+05	1	0.14	~Aroclor 1248	12672-29-6	1.6E+00	2.8E+00	1.3E+01	9.5E-01				
2.0E+00	S	5.7E-04	S	2.0E-05	I			V			1.4E+09	8.4E+05	1	0.14	~Aroclor 1254	11097-69-1	1.6E+00	2.8E+00	1.8E+01	9.7E-01	2.3E+01	3.9E+01		1.5E+01
2.0E+00	S	5.7E-04	S					V			1.4E+09	1.3E+06	1	0.14	~Aroclor 1260	11096-82-5	1.6E+00	2.8E+00	2.8E+01	9.9E-01				
				6.0E-04	X			V			1.4E+09	9.8E+05	1	0.14	~Aroclor 5460	11126-42-4					7.0E+02	1.2E+03		4.4E+02
3.9E+00	E	1.1E-03	E	2.3E-05	E	1.3E-03	E	V			1.4E+09	2.4E+06	1	0.14	~Heptachlorobiphenyl, 2,3,3',4,4',5,5'- (PCB 189)	39635-31-9	8.4E-01	1.4E+00	2.6E+01	5.2E-01	2.7E+01	4.6E+01	1.4E+04	1.7E+01
3.9E+00	E	1.1E-03	E	2.3E-05	E	1.3E-03	E	V			1.4E+09	1.6E+06	1	0.14	~Hexachlorobiphenyl, 2,3',4,4',5,5'- (PCB 167)	52663-72-6	8.4E-01	1.4E+00	1.7E+01	5.1E-01	2.7E+01	4.6E+01	9.2E+03	1.7E+01
3.9E+00	E	1.1E-03	E	2.3E-05	E	1.3E-03	E	V			1.4E+09	1.0E+06	1	0.14	~Hexachlorobiphenyl, 2,3,3',4,4',5'- (PCB 157)	69782-90-7	8.4E-01	1.4E+00	1.1E+01	5.0E-01	2.7E+01	4.6E+01	6.1E+03	1.7E+01
3.9E+00	E	1.1E-03	E	2.3E-05	E	1.3E-03	E	V			1.4E+09	1.1E+06	1	0.14	~Hexachlorobiphenyl, 2,3,3',4,4',5- (PCB 156)	38380-08-4	8.4E-01	1.4E+00	1.2E+01	5.0E-01	2.7E+01	4.6E+01	6.5E+03	1.7E+01
3.9E+03	E	1.1E+00	E	2.3E-08	E	1.3E-06	E	V			1.4E+09	1.6E+06	1	0.14	~Hexachlorobiphenyl, 3,3',4,4',5,5'- (PCB 169)	32774-16-6	8.4E-04	1.4E-03	1.7E-02	5.1E-04	2.7E-02	4.6E-02	9.2E+00	1.7E-02
3.9E+00	E	1.1E-03	E	2.3E-05	E	1.3E-03	E	V			1.4E+09	7.3E+05	1	0.14	~Pentachlorobiphenyl, 2',3,4,4',5- (PCB 123)	65510-44-3	8.4E-01	1.4E+00	7.9E+00	4.9E-01	2.7E+01	4.6E+01	4.3E+03	1.7E+01
3.9E+00	E	1.1E-03	E	2.3E-05	E	1.3E-03	E	V			1.4E+09	5.9E+05	1	0.14	~Pentachlorobiphenyl, 2,3',4,4',5- (PCB 118)	31508-00-6	8.4E-01	1.4E+00	6.3E+00	4.9E-01	2.7E+01	4.6E+01	3.4E+03	1.7E+01
3.9E+00	E	1.1E-03	E	2.3E-05	E	1.3E-03	E	V			1.4E+09	6.0E+05	1	0.14	~Pentachlorobiphenyl, 2,3,3',4,4'- (PCB 105)	32598-14-4	8.4E-01	1.4E+00	6.5E+00	4.9E-01	2.7E+01	4.6E+01	3.5E+03	1.7E+01
3.9E+00	E	1.1E-03	E	2.3E-05	E	1.3E-03	E	V			1.4E+09	1.1E+06	1	0.14	~Pentachlorobiphenyl, 2,3,4,4',5- (PCB 114)	74472-37-0	8.4E-01	1.4E+00	1.1E+01	5.0E-01	2.7E+01	4.6E+01	6.1E+03	1.7E+01
1.3E+04	E	3.8E+00	E	7.0E-09	E	4.0E-07	E	V			1.4E+09	7.3E+05	1	0.14	~Pentachlorobiphenyl, 3,3',4,4',5- (PCB 126)	57465-28-8	2.5E-04	4.2E-04	2.3E-03	1.5E-04	8.2E-03	1.4E-02	1.3E+00	5.1E-03

Key: I = IRIS; P = PPRTV; D = DWSHA; O = OPP; A = ATSDR; C = Cal EPA; X = APPENDIX PPRTV SCREEN (See FAQ #29); H = HEAST; F = See FAQ; E = see user guide Section 2.3.5; W = see user guide Section 2.3.6; L = see user guide on lead; M = mutagen; S = see user guide Section 5; V = volatile; R = RBA applied (See User Guide for Arsenic notice) ; c = cancer; n = noncancer; * = where: n SL < 100X c SL; ** = where n SL < 10X c SL; SSL values are based on DAF=1; m = Concentration may exceed ceiling limit (See User Guide); s = Concentration may exceed Csat (See User Guide)

Toxicity and Chemical-specific Information														Contaminant		Carcinogenic Target Risk (TR) = 1E-06				Noncancer Hazard Index (HI) = 1			
SFO (mg/kg-day)$^{-1}$	key	IUR (ug/m^3)$^{-1}$	key	RfD_o (mg/kg-day)	key	RfC_i (mg/m^3)	key	vol	muta-gen	C_{sat} (mg/kg)	PEF (m^3/kg)	VF (m^3/kg)	GIABS	ABS	Analyte	CAS No.	Ingestion SL TR=1E-06 (mg/kg)	Dermal SL TR=1E-06 (mg/kg)	Inhalation SL TR=1E-06 (mg/kg)	Carcinogenic SL TR=1E-06 (mg/kg)	Ingestion SL THQ=1 (mg/kg)	Dermal SL THQ=1 (mg/kg)	Inhalation SL THQ=1 (mg/kg)	Noncarcinogenic SL THI=1 (mg/kg)
2.0E+00	I	5.7E-04	I					V			1.4E+09	5.3E+05	1	0.14	~Polychlorinated Biphenyls (high risk)	1336-36-3	1.6E+00	2.8E+00	1.1E+01	9.4E-01				
4.0E-01	I	1.0E-04	I					V					1	0.14	~Polychlorinated Biphenyls (low risk)	1336-36-3								
7.0E-02	I	2.0E-05	I					V					1	0.14	~Polychlorinated Biphenyls (lowest risk)	1336-36-3								
1.3E+01	E	3.8E-03	E	7.0E-06	E	4.0E-04	E				1.4E+09		1	0.14	~Tetrachlorobiphenyl, 3,3',4,4'- (PCB 77)	32598-13-3	2.5E-01	4.2E-01	4.4E+03	1.6E-01	8.2E+00	1.4E+01	2.4E+06	5.1E+00
3.9E+01	E	1.1E-02	E	2.3E-06	E	1.3E-04	E	V			1.4E+09	5.1E+05	1	0.14	~Tetrachlorobiphenyl, 3,4,4',5- (PCB 81)	70362-50-4	8.4E-02	1.4E-01	5.5E-01	4.8E-02	2.7E+00	4.6E+00	3.0E+02	1.7E+00
						6.0E-04	I				1.4E+09		1	0.1	Polymeric Methylene Diphenyl Diisocyanate (PMDI)	9016-87-9							3.6E+06	3.6E+06
															Polynuclear Aromatic Hydrocarbons (PAHs)									
				6.0E-02	I			V			1.4E+09	1.4E+05	1	0.13	~Acenaphthene	83-32-9					7.0E+04	1.3E+05		4.5E+04
				3.0E-01	I			V			1.4E+09	5.2E+05	1	0.13	~Anthracene	120-12-7					3.5E+05	6.4E+05		2.3E+05
1.0E-01	E	6.0E-05	E					V	M		1.4E+09	4.4E+06	1	0.13	~Benz[a]anthracene	56-55-3	3.3E+01	5.9E+01	9.0E+02	2.1E+01				
1.2E+00	C	1.1E-04	C								1.4E+09		1	0.13	~Benzo(j)fluoranthene	205-82-3	2.7E+00	5.0E+00	1.5E+05	1.8E+00				
1.0E+00	I	6.0E-04	I	3.0E-04	I	2.0E-06	I		M		1.4E+09		1	0.13	~Benzo[a]pyrene	50-32-8	3.3E+00	5.9E+00	2.8E+04	2.1E+00	3.5E+02	6.4E+02	1.2E+04	2.2E+02
1.0E-01	E	6.0E-05	E						M		1.4E+09		1	0.13	~Benzo[b]fluoranthene	205-99-2	3.3E+01	5.9E+01	2.8E+05	2.1E+01				
1.0E-02	E	6.0E-06	E						M		1.4E+09		1	0.13	~Benzo[k]fluoranthene	207-08-9	3.3E+02	5.9E+02	2.8E+06	2.1E+02				
				8.0E-02	I			V			1.4E+09	8.0E+04	1	0.13	~Chloronaphthalene, Beta-	91-58-7					9.3E+04	1.7E+05		6.0E+04
1.0E-03	E	6.0E-07	E						M		1.4E+09		1	0.13	~Chrysene	218-01-9	3.3E+03	5.9E+03	2.8E+07	2.1E+03				
1.0E+00	E	6.0E-04	E						M		1.4E+09		1	0.13	~Dibenz[a,h]anthracene	53-70-3	3.3E+00	5.9E+00	2.8E+04	2.1E+00				
1.2E+01	C	1.1E-03	C								1.4E+09		1	0.13	~Dibenzo(a,e)pyrene	192-65-4	2.7E-01	5.0E-01	1.5E+04	1.8E-01				
2.5E+02	C	7.1E-02	C						M		1.4E+09		1	0.13	~Dimethylbenz(a)anthracene, 7,12-	57-97-6	1.3E-02	2.4E-02	2.3E+02	8.4E-03				
				4.0E-02	I						1.4E+09		1	0.13	~Fluoranthene	206-44-0					4.7E+04	8.5E+04		3.0E+04
				4.0E-02	I			V			1.4E+09	2.8E+05	1	0.13	~Fluorene	86-73-7					4.7E+04	8.5E+04		3.0E+04
1.0E-01	E	6.0E-05	E						M		1.4E+09		1	0.13	~Indeno[1,2,3-cd]pyrene	193-39-5	3.3E+01	5.9E+01	2.8E+05	2.1E+01				
2.9E-02	P			7.0E-02	A			V		3.9E+02	1.4E+09	5.9E+04	1	0.13	~Methylnaphthalene, 1-	90-12-0	1.1E+02	2.0E+02		7.3E+01	8.2E+04	1.5E+05		5.3E+04
				4.0E-03	I			V			1.4E+09	5.8E+04	1	0.13	~Methylnaphthalene, 2-	91-57-6					4.7E+03	8.5E+03		3.0E+03
		3.4E-05	C	2.0E-02	I	3.0E-03	I	V			1.4E+09	4.6E+04	1	0.13	~Naphthalene	91-20-3			1.7E+01	1.7E+01	2.3E+04	4.2E+04	6.1E+02	5.9E+02
1.2E+00	C	1.1E-04	C								1.4E+09		1	0.13	~Nitropyrene, 4-	57835-92-4	2.7E+00	5.0E+00	1.5E+05	1.8E+00				
				3.0E-02	I			V			1.4E+09	2.4E+06	1	0.13	~Pyrene	129-00-0					3.5E+04	6.4E+04		2.3E+04
				2.0E-02	P						1.4E+09		1	0.1	Potassium Perfluorobutane Sulfonate	29420-49-3					2.3E+04	5.5E+04		1.6E+04
1.5E-01	I			9.0E-03	I						1.4E+09		1	0.1	Prochloraz	67747-09-5	2.2E+01	5.2E+01		1.5E+01	1.1E+04	2.5E+04		7.4E+03
				6.0E-03	H			V			1.4E+09	4.2E+05	1		Profluralin	26399-36-0					7.0E+03			7.0E+03
				1.5E-02	I						1.4E+09		1	0.1	Prometon	1610-18-0					1.8E+04	4.1E+04		1.2E+04
				4.0E-02	O						1.4E+09		1	0.1	Prometryn	7287-19-6					4.7E+04	1.1E+05		3.3E+04
				1.3E-02	I						1.4E+09		1	0.1	Propachlor	1918-16-7					1.5E+04	3.6E+04		1.1E+04
				5.0E-03	I						1.4E+09		1	0.1	Propanil	709-98-8					5.8E+03	1.4E+04		4.1E+03
3.3E-02	O			4.0E-02	O						1.4E+09		1	0.1	Propargite	2312-35-8	1.0E+02	2.4E+02		7.0E+01	4.7E+04	1.1E+05		3.3E+04
				2.0E-03	I			V		1.1E+05	1.4E+09	6.3E+04	1		Propargyl Alcohol	107-19-7					2.3E+03			2.3E+03
				2.0E-02	I						1.4E+09		1	0.1	Propazine	139-40-2					2.3E+04	5.5E+04		1.6E+04
				2.0E-02	I						1.4E+09		1	0.1	Propham	122-42-9					2.3E+04	5.5E+04		1.6E+04
				1.0E-01	O						1.4E+09		1	0.1	Propiconazole	60207-90-1					1.2E+05	2.8E+05		8.2E+04
						8.0E-03	I	V		3.3E+04	1.4E+09	8.9E+03	1		Propionaldehyde	123-38-6							3.1E+02	3.1E+02
				1.0E-01	X	1.0E+00	X	V		2.6E+02	1.4E+09	7.0E+03	1		Propyl benzene	103-65-1					1.2E+05		3.1E+04	2.4E+04
						3.0E+00	C	V		3.5E+02	1.4E+09	7.0E+02	1		Propylene	115-07-1							9.3E+03	9.3E+03
				2.0E+01	P						1.4E+09		1	0.1	Propylene Glycol	57-55-6					2.3E+07	5.5E+07		1.6E+07
						2.7E-04	A				1.4E+09		1	0.1	Propylene Glycol Dinitrate	6423-43-4							1.6E+06	1.6E+06
				7.0E-01	H	2.0E+00	I	V		1.1E+05	1.4E+09	7.8E+04	1		Propylene Glycol Monomethyl Ether	107-98-2					8.2E+05		6.9E+05	3.7E+05
2.4E-01	I	3.7E-06	I			3.0E-02	I	V		7.8E+04	1.4E+09	1.0E+04	1		Propylene Oxide	75-56-9	1.4E+01		3.4E+01	9.7E+00			1.4E+03	1.4E+03
				7.5E-02	I						1.4E+09		1	0.1	Propyzamide	23950-58-5					8.8E+04	2.1E+05		6.2E+04
				1.0E-03	I			V		5.3E+05	1.4E+09	5.5E+04	1		Pyridine	110-86-1					1.2E+03			1.2E+03
				5.0E-04	I						1.4E+09		1	0.1	Quinalphos	13593-03-8					5.8E+02	1.4E+03		4.1E+02
3.0E+00	I										1.4E+09		1	0.1	Quinoline	91-22-5	1.1E+00	2.6E+00		7.7E-01				
				9.0E-03	I						1.4E+09		1	0.1	Quizalofop-ethyl	76578-14-8					1.1E+04	2.5E+04		7.4E+03
						3.0E-02	A				1.4E+09		1		Refractory Ceramic Fibers	E715557							1.8E+08	1.8E+08
				3.0E-02	I						1.4E+09		1	0.1	Resmethrin	10453-86-8					3.5E+04	8.3E+04		2.5E+04
				5.0E-02	H			V			1.4E+09	4.6E+05	1		Ronnel	299-84-3					5.8E+04			5.8E+04
				4.0E-03	I						1.4E+09		1	0.1	Rotenone	83-79-4					4.7E+03	1.1E+04		3.3E+03
2.2E-01	C	6.3E-05	C						M		1.4E+09		1	0.1	Safrole	94-59-7	1.5E+01	3.5E+01	2.6E+05	1.0E+01				
				5.0E-03	I						1.4E+09		1		Selenious Acid	7783-00-8					5.8E+03			5.8E+03
				5.0E-03	I	2.0E-02	C				1.4E+09		1		Selenium	7782-49-2					5.8E+03		1.2E+08	5.8E+03
				5.0E-03	C	2.0E-02	C				1.4E+09		1		Selenium Sulfide	7446-34-6					5.8E+03		1.2E+08	5.8E+03
				1.4E-01	O						1.4E+09		1	0.1	Sethoxydim	74051-80-2					1.6E+05	3.9E+05		1.1E+05
						3.0E-03	C				1.4E+09		1		Silica (crystalline, respirable)	7631-86-9							1.8E+07	1.8E+07
				5.0E-03	I						1.4E+09		0.04		Silver	7440-22-4					5.8E+03			5.8E+03
1.2E-01	H			5.0E-03	I						1.4E+09		1	0.1	Simazine	122-34-9	2.7E+01	6.4E+01		1.9E+01	5.8E+03	1.4E+04		4.1E+03
				1.3E-02	I						1.4E+09		1	0.1	Sodium Acifluorfen	62476-59-9					1.5E+04	3.6E+04		1.1E+04
				4.0E-03	I						1.4E+09		1		Sodium Azide	26628-22-8					4.7E+03			4.7E+03
2.7E-01	H			3.0E-02	I						1.4E+09		1	0.1	Sodium Diethyldithiocarbamate	148-18-5	1.2E+01	2.9E+01		8.5E+00	3.5E+04	8.3E+04		2.5E+04
				5.0E-02	A	1.3E-02	C				1.4E+09		1		Sodium Fluoride	7681-49-4					5.8E+04		7.7E+07	5.8E+04
				2.0E-05	I						1.4E+09		1	0.1	Sodium Fluoroacetate	62-74-8					2.3E+01	5.5E+01		1.6E+01
				1.0E-03	H						1.4E+09		1		Sodium Metavanadate	13718-26-8					1.2E+03			1.2E+03
				8.0E-04	P						1.4E+09		1		Sodium Tungstate	13472-45-2					9.3E+02			9.3E+02

Key: I = IRIS; P = PPRTV; D = DWSHA; O = OPP; A = ATSDR; C = Cal EPA; X = APPENDIX PPRTV SCREEN (See FAQ #29); H = HEAST; F = See FAQ; E = see user guide Section 2.3.5; W = see user guide Section 2.3.6; L = see user guide on lead; M = mutagen; S = see user guide Section 5; V = volatile; R = RBA applied (See User Guide for Arsenic notice) ; c = cancer; n = noncancer; * = where: n SL < 100X c SL; ** = where n SL < 10X c SL; SSL values are based on DAF=1; m = Concentration may exceed ceiling limit (See User Guide); s = Concentration may exceed Csat (See User Guide)

Toxicity and Chemical-specific Information														Contaminant		Carcinogenic Target Risk (TR) = 1E-06				Noncancer Hazard Index (HI) = 1			
SFO (mg/kg-day)$^{-1}$	key	IUR (ug/m^3)$^{-1}$	key	RfD_o (mg/kg-day)	key	RfC_i (mg/m^3)	key	vol	muta-gen	C_{sat} (mg/kg)	PEF (m^3/kg)	VF (m^3/kg)	GIABS	ABS	Analyte	CAS No.	Ingestion SL TR=1E-06 (mg/kg)	Dermal SL TR=1E-06 (mg/kg)	Inhalation SL TR=1E-06 (mg/kg)	Carcinogenic SL TR=1E-06 (mg/kg)	Ingestion SL THQ=1 (mg/kg)	Dermal SL THQ=1 (mg/kg)	Inhalation SL THQ=1 (mg/kg)	Noncarcinogenic SL THI=1 (mg/kg)
				8.0E-04	P						1.4E+09		1		Sodium Tungstate Dihydrate	10213-10-2					9.3E+02			9.3E+02
2.4E-02	H			3.0E-02	I						1.4E+09		1	0.1	Stirofos (Tetrachlorovinphos)	961-11-5	1.4E+02	3.2E+02		9.6E+01	3.5E+04	8.3E+04		2.5E+04
				6.0E-01	I						1.4E+09		1		Strontium, Stable	7440-24-6					7.0E+05			7.0E+05
				3.0E-04	I						1.4E+09		1	0.1	Strychnine	57-24-9					3.5E+02	8.3E+02		2.5E+02
				2.0E-01	I	1.0E+00	I	V		8.7E+02	1.4E+09	9.3E+03	1		Styrene	100-42-5					2.3E+05		4.1E+04	3.5E+04
				3.0E-03	P						1.4E+09		1	0.1	Styrene-Acrylonitrile (SAN) Trimer						3.5E+03	8.3E+03		2.5E+03
				1.0E-03	P	2.0E-03	X				1.4E+09		1	0.1	Sulfolane	126-33-0					1.2E+03	2.8E+03	1.2E+07	8.2E+02
				8.0E-04	P						1.4E+09		1	0.1	Sulfonylbis(4-chlorobenzene), 1,1'-	80-07-9					9.3E+02	2.2E+03		6.6E+02
						1.0E-03	C	V			1.4E+09		1		Sulfur Trioxide	7446-11-9							6.0E+06	6.0E+06
						1.0E-03	C				1.4E+09		1		Sulfuric Acid	7664-93-9							6.0E+06	6.0E+06
2.5E-02	I	7.1E-06	I	5.0E-02	H						1.4E+09		1	0.1	Sulfurous acid, 2-chloroethyl 2-[4-(1,1-dimethylethyl)phenoxy]-1-methylethyl ester	140-57-8	1.3E+02	3.1E+02	2.3E+06	9.2E+01	5.8E+04	1.4E+05		4.1E+04
				3.0E-02	H						1.4E+09		1	0.1	TCMTB	21564-17-0					3.5E+04	8.3E+04		2.5E+04
				7.0E-02	I						1.4E+09		1	0.1	Tebuthiuron	34014-18-1					8.2E+04	1.9E+05		5.7E+04
				2.0E-02	H						1.4E+09		1	0.1	Temephos	3383-96-8					2.3E+04	5.5E+04		1.6E+04
				1.3E-02	I						1.4E+09		1	0.1	Terbacil	5902-51-2					1.5E+04	3.6E+04		1.1E+04
				2.5E-05	H			V		3.1E+01	1.4E+09	2.6E+05	1		Terbufos	13071-79-9					2.9E+01			2.9E+01
				1.0E-03	I						1.4E+09		1	0.1	Terbutryn	886-50-0					1.2E+03	2.8E+03		8.2E+02
				1.0E-04	I						1.4E+09		1	0.1	Tetrabromodiphenyl ether, 2,2',4,4'- (BDE-47)	5436-43-1					1.2E+02	2.8E+02		8.2E+01
				3.0E-04	I			V			1.4E+09	5.1E+04	1		Tetrachlorobenzene, 1,2,4,5-	95-94-3					3.5E+02			3.5E+02
2.6E-02	I	7.4E-06	I	3.0E-02	I			V		6.8E+02	1.4E+09	5.7E+03	1		Tetrachloroethane, 1,1,1,2-	630-20-6	1.3E+02		9.4E+00	8.8E+00	3.5E+04			3.5E+04
2.0E-01	I	5.8E-05	C	2.0E-02	I			V		1.9E+03	1.4E+09	1.5E+04	1		Tetrachloroethane, 1,1,2,2-	79-34-5	1.6E+01		3.2E+00	2.7E+00	2.3E+04			2.3E+04
2.1E-03	I	2.6E-07	I	6.0E-03	I	4.0E-02	I	V		1.7E+02	1.4E+09	2.3E+03	1		Tetrachloroethylene	127-18-4	1.6E+03		1.1E+02	1.0E+02	7.0E+03		4.1E+02	3.9E+02
				3.0E-02	I						1.4E+09		1	0.1	Tetrachlorophenol, 2,3,4,6-	58-90-2					3.5E+04	8.3E+04		2.5E+04
2.0E+01	H							V			1.4E+09	1.1E+05	1		Tetrachlorotoluene, p- alpha, alpha, alpha-	5216-25-1	1.6E-01			1.6E-01				
				5.0E-04	I						1.4E+09		1	0.1	Tetraethyl Dithiopyrophosphate	3689-24-5					5.8E+02	1.4E+03		4.1E+02
						8.0E+01	I	V		2.1E+03	1.4E+09	1.2E+03	1		Tetrafluoroethane, 1,1,1,2-	811-97-2							4.3E+05	4.3E+05
				2.0E-03	P						1.4E+09		1	0.0007	Tetryl (Trinitrophenylmethylnitramine)	479-45-8					2.3E+03	8.5E+05		2.3E+03
				2.0E-05	S						1.4E+09		1		Thallic Oxide	1314-32-5					2.3E+01			2.3E+01
				1.0E-05	X						1.4E+09		1		Thallium (I) Nitrate	10102-45-1					1.2E+01			1.2E+01
				1.0E-05	X						1.4E+09		1		Thallium (Soluble Salts)	7440-28-0					1.2E+01			1.2E+01
				1.0E-05	X			V			1.4E+09		1		Thallium Acetate	563-68-8					1.2E+01			1.2E+01
				2.0E-05	X			V			1.4E+09		1		Thallium Carbonate	6533-73-9					2.3E+01			2.3E+01
				1.0E-05	X						1.4E+09		1		Thallium Chloride	7791-12-0					1.2E+01			1.2E+01
				1.0E-05	S						1.4E+09		1		Thallium Selenite	12039-52-0					1.2E+01			1.2E+01
				2.0E-05	X						1.4E+09		1		Thallium Sulfate	7446-18-6					2.3E+01			2.3E+01
				4.3E-02	O						1.4E+09		1	0.1	Thifensulfuron-methyl	79277-27-3					5.0E+04	1.2E+05		3.5E+04
				1.0E-02	I						1.4E+09		1	0.1	Thiobencarb	28249-77-6					1.2E+04	2.8E+04		8.2E+03
				7.0E-02	X						1.4E+09		1	0.0075	Thiodiglycol	111-48-8					8.2E+04	2.6E+06		7.9E+04
				3.0E-04	H						1.4E+09		1	0.1	Thiofanox	39196-18-4					3.5E+02	8.3E+02		2.5E+02
1.2E-02	O			2.7E-02	O						1.4E+09		1	0.1	Thiophanate, Methyl	23564-05-8	2.8E+02	6.7E+02		2.0E+02	3.1E+04	7.4E+04		2.2E+04
				1.5E-02	O						1.4E+09		1	0.1	Thiram	137-26-8					1.8E+04	4.1E+04		1.2E+04
				6.0E-01	H						1.4E+09		1		Tin	7440-31-5					7.0E+05			7.0E+05
						1.0E-04	A	V			1.4E+09		1		Titanium Tetrachloride	7550-45-0							6.0E+05	6.0E+05
				8.0E-02	I	5.0E+00	I	V		8.2E+02	1.4E+09	4.3E+03	1		Toluene	108-88-3					9.3E+04		9.4E+04	4.7E+04
		1.1E-05	C			8.0E-06	C	V			1.4E+09	7.6E+05	1		Toluene-2,4-diisocyanate	584-84-9			8.5E+02	8.5E+02			2.7E+01	2.7E+01
1.8E-01	X			2.0E-04	X						1.4E+09		1	0.1	Toluene-2,5-diamine	95-70-5	1.8E+01	4.3E+01		1.3E+01	2.3E+02	5.5E+02		1.6E+02
		1.1E-05	C			8.0E-06	C	V		1.7E+03	1.4E+09	6.3E+05	1		Toluene-2,6-diisocyanate	91-08-7			7.0E+02	7.0E+02			2.2E+01	2.2E+01
				5.0E-03	P						1.4E+09		1	0.1	Toluic Acid, p-	99-94-5					5.8E+03	1.4E+04		4.1E+03
1.6E-02	P	5.1E-05	C								1.4E+09		1	0.1	Toluidine, o- (Methylaniline, 2-)	95-53-4	2.0E+02	4.8E+02	3.3E+05	1.4E+02				
3.0E-02	P			4.0E-03	X						1.4E+09		1	0.1	Toluidine, p-	106-49-0	1.1E+02	2.6E+02		7.7E+01	4.7E+03	1.1E+04		3.3E+03
				3.0E+00	P			V		3.4E-01	1.4E+09	1.4E+03	1		Total Petroleum Hydrocarbons (Aliphatic High)	E1790670					3.5E+06			3.5E+06
						6.0E-01	P	V		1.4E+02	1.4E+09	8.3E+02	1		Total Petroleum Hydrocarbons (Aliphatic Low)	E1790666							2.2E+03	2.2E+03
				1.0E-02	X	1.0E-01	P	V		6.9E+00	1.4E+09	1.0E+03	1		Total Petroleum Hydrocarbons (Aliphatic Medium)	E1790668					1.2E+04		4.6E+02	4.4E+02
				4.0E-02	P						1.4E+09		1	0.1	Total Petroleum Hydrocarbons (Aromatic High)	E1790676					4.7E+04	1.1E+05		3.3E+04
				4.0E-03	P	3.0E-02	P	V		1.8E+03	1.4E+09	3.5E+03	1		Total Petroleum Hydrocarbons (Aromatic Low)	E1790672					4.7E+03		4.6E+02	4.2E+02
				4.0E-03	P	3.0E-03	P	V			1.4E+09	5.2E+04	1		Total Petroleum Hydrocarbons (Aromatic Medium)	E1790674					4.7E+03		6.9E+02	6.0E+02
1.1E+00	I	3.2E-04	I								1.4E+09		1	0.1	Toxaphene	8001-35-2	3.0E+00	7.0E+00	5.2E+04	2.1E+00				
				7.5E-03	I						1.4E+09		1	0.1	Tralomethrin	66841-25-6					8.8E+03	2.1E+04		6.2E+03
				3.0E-04	A			V			1.4E+09	3.4E+03	1		Tri-n-butyltin	688-73-3					3.5E+02			3.5E+02
				8.0E+01	X						1.4E+09		1	0.1	Triacetin	102-76-1					9.3E+07	2.2E+08		6.6E+07
				3.4E-02	O						1.4E+09		1	0.1	Triadimefon	43121-43-3					4.0E+04	9.4E+04		2.8E+04
7.2E-02	O			2.5E-02	O			V			1.4E+09	3.6E+05	1		Triallate	2303-17-5	4.6E+01			4.6E+01	2.9E+04			2.9E+04
				1.0E-02	I						1.4E+09		1	0.1	Triasulfuron	82097-50-5					1.2E+04	2.8E+04		8.2E+03
				8.0E-03	I						1.4E+09		1	0.1	Tribenuron-methyl	101200-48-0					9.3E+03	2.2E+04		6.6E+03
				5.0E-03	I			V			1.4E+09	4.8E+04	1		Tribromobenzene, 1,2,4-	615-54-3					5.8E+03			5.8E+03
				9.0E-03	X						1.4E+09		1	0.1	Tribromophenol, 2,4,6-	118-79-6					1.1E+04	2.5E+04		7.4E+03
9.0E-03	P			1.0E-02	P						1.4E+09		1	0.1	Tributyl Phosphate	126-73-8	3.6E+02	8.6E+02		2.6E+02	1.2E+04	2.8E+04		8.2E+03
				3.0E-04	P						1.4E+09		1	0.1	Tributyltin Compounds	E1790678					3.5E+02	8.3E+02		2.5E+02
				3.0E-04	I						1.4E+09		1	0.1	Tributyltin Oxide	56-35-9					3.5E+02	8.3E+02		2.5E+02
				3.0E+01	I	5.0E+00	P	V		9.1E+02	1.4E+09	1.3E+03	1		Trichloro-1,2,2-trifluoroethane, 1,1,2-	76-13-1					3.5E+07		2.8E+04	2.8E+04

Key: I = IRIS; P = PPRTV; D = DWSHA; O = OPP; A = ATSDR; C = Cal EPA; X = APPENDIX PPRTV SCREEN (See FAQ #29); H = HEAST; F = See FAQ; E = see user guide Section 2.3.5; W = see user guide Section 2.3.6; L = see user guide on lead; M = mutagen; S = see user guide Section 5; V = volatile; R = RBA applied (See User Guide for Arsenic notice) ; c = cancer; n = noncancer; * = where: n SL < 100X c SL; ** = where n SL < 10X c SL; SSL values are based on DAF=1; m = Concentration may exceed ceiling limit (See User Guide); s = Concentration may exceed Csat (See User Guide)

Toxicity and Chemical-specific Information														Contaminant		Carcinogenic Target Risk (TR) = 1E-06				Noncancer Hazard Index (HI) = 1			
SFO (mg/kg-day)$^{-1}$	key	IUR (ug/m^3)$^{-1}$	key	RfD_o (mg/kg-day)	key	RfC_i (mg/m^3)	key	vol	muta-gen	C_{sat} (mg/kg)	PEF (m^3/kg)	VF (m^3/kg)	GIABS	ABS	Analyte	CAS No.	Ingestion SL TR=1E-06 (mg/kg)	Dermal SL TR=1E-06 (mg/kg)	Inhalation SL TR=1E-06 (mg/kg)	Carcinogenic SL TR=1E-06 (mg/kg)	Ingestion SL THQ=1 (mg/kg)	Dermal SL THQ=1 (mg/kg)	Inhalation SL THQ=1 (mg/kg)	Noncarcinogenic SL THI=1 (mg/kg)
7.0E-02	I			2.0E-02	I						1.4E+09		1	0.1	Trichloroacetic Acid	76-03-9	4.7E+01	1.1E+02		3.3E+01	2.3E+04	5.5E+04		1.6E+04
2.9E-02	H										1.4E+09		1	0.1	Trichloroaniline HCl, 2,4,6-	33663-50-2	1.1E+02	2.7E+02		7.9E+01				
7.0E-03	X			3.0E-05	X						1.4E+09		1	0.1	Trichloroaniline, 2,4,6-	634-93-5	4.7E+02	1.1E+03		3.3E+02	3.5E+01	8.3E+01		2.5E+01
				8.0E-04	X			V			1.4E+09	3.2E+04	1		Trichlorobenzene, 1,2,3-	87-61-6					9.3E+02			9.3E+02
2.9E-02	P			1.0E-02	I	2.0E-03	P	V		4.0E+02	1.4E+09	3.0E+04	1		Trichlorobenzene, 1,2,4-	120-82-1	1.1E+02			1.1E+02	1.2E+04		2.6E+02	2.6E+02
				2.0E+00	I	5.0E+00	I	V		6.4E+02	1.4E+09	1.6E+03	1		Trichloroethane, 1,1,1-	71-55-6					2.3E+06		3.6E+04	3.6E+04
5.7E-02	I	1.6E-05	I	4.0E-03	I	2.0E-04	X	V		2.2E+03	1.4E+09	7.2E+03	1		Trichloroethane, 1,1,2-	79-00-5	5.7E+01		5.5E+00	5.0E+00	4.7E+03		6.3E+00	6.3E+00
4.6E-02	I	4.1E-06	I	5.0E-04	I	2.0E-03	I	V	M	6.9E+02	1.4E+09	2.2E+03	1		Trichloroethylene	79-01-6	7.1E+01		6.6E+00	6.0E+00	5.8E+02		1.9E+01	1.9E+01
				3.0E-01	I			V		1.2E+03	1.4E+09	1.0E+03	1		Trichlorofluoromethane	75-69-4					3.5E+05			3.5E+05
				1.0E-01	I						1.4E+09		1	0.1	Trichlorophenol, 2,4,5-	95-95-4					1.2E+05	2.8E+05		8.2E+04
1.1E-02	I	3.1E-06	I	1.0E-03	P						1.4E+09		1	0.1	Trichlorophenol, 2,4,6-	88-06-2	3.0E+02	7.0E+02	5.4E+06	2.1E+02	1.2E+03	2.8E+03		8.2E+02
				1.0E-02	I						1.4E+09		1	0.1	Trichlorophenoxyacetic Acid, 2,4,5-	93-76-5					1.2E+04	2.8E+04		8.2E+03
				8.0E-03	I						1.4E+09		1	0.1	Trichlorophenoxypropionic acid, -2,4,5	93-72-1					9.3E+03	2.2E+04		6.6E+03
				5.0E-03	I			V		1.3E+03	1.4E+09	1.5E+04	1		Trichloropropane, 1,1,2-	598-77-6					5.8E+03			5.8E+03
3.0E+01	I			4.0E-03	I	3.0E-04	I	V	M	1.4E+03	1.4E+09	1.6E+04	1		Trichloropropane, 1,2,3-	96-18-4	1.1E-01			1.1E-01	4.7E+03		2.1E+01	2.1E+01
				3.0E-03	X	3.0E-04	P	V		3.1E+02	1.4E+09	2.3E+03	1		Trichloropropene, 1,2,3-	96-19-5					3.5E+03		3.1E+00	3.1E+00
				2.0E-02	A						1.4E+09		1	0.1	Tricresyl Phosphate (TCP)	1330-78-5					2.3E+04	5.5E+04		1.6E+04
				3.0E-03	I						1.4E+09		1	0.1	Tridiphane	58138-08-2					3.5E+03	8.3E+03		2.5E+03
						7.0E-03	I	V		2.8E+04	1.4E+09	1.6E+04	1		Triethylamine	121-44-8							4.8E+02	4.8E+02
				2.0E+00	P						1.4E+09		1	0.1	Triethylene Glycol	112-27-6					2.3E+06	5.5E+06		1.6E+06
						2.0E+01	P	V		4.8E+03	1.4E+09	7.1E+02	1		Trifluoroethane, 1,1,1-	420-46-2							6.2E+04	6.2E+04
7.7E-03	I			7.5E-03	I			V			1.4E+09	5.1E+05	1		Trifluralin	1582-09-8	4.2E+02			4.2E+02	8.8E+03			8.8E+03
2.0E-02	P			1.0E-02	P						1.4E+09		1	0.1	Trimethyl Phosphate	512-56-1	1.6E+02	3.9E+02		1.1E+02	1.2E+04	2.8E+04		8.2E+03
				1.0E-02	I	6.0E-02	I	V		2.9E+02	1.4E+09	9.4E+03	1		Trimethylbenzene, 1,2,3-	526-73-8					1.2E+04		2.5E+03	2.0E+03
				1.0E-02	I	6.0E-02	I	V		2.2E+02	1.4E+09	7.9E+03	1		Trimethylbenzene, 1,2,4-	95-63-6					1.2E+04		2.1E+03	1.8E+03
				1.0E-02	I	6.0E-02	I	V		1.8E+02	1.4E+09	6.6E+03	1		Trimethylbenzene, 1,3,5-	108-67-8					1.2E+04		1.7E+03	1.5E+03
				1.0E-02	X			V		3.0E+01	1.4E+09	1.0E+03	1		Trimethylpentene, 2,4,4-	25167-70-8					1.2E+04			1.2E+04
				3.0E-02	I						1.4E+09		1	0.019	Trinitrobenzene, 1,3,5-	99-35-4					3.5E+04	4.4E+05		3.2E+04
3.0E-02	I			5.0E-04	I						1.4E+09		1	0.032	Trinitrotoluene, 2,4,6-	118-96-7	1.1E+02	8.0E+02		9.6E+01	5.8E+02	4.3E+03		5.1E+02
				2.0E-02	P						1.4E+09		1	0.1	Triphenylphosphine Oxide	791-28-6					2.3E+04	5.5E+04		1.6E+04
				2.0E-02	A						1.4E+09		1	0.1	Tris(1,3-Dichloro-2-propyl) Phosphate	13674-87-8					2.3E+04	5.5E+04		1.6E+04
				1.0E-02	X						1.4E+09		1	0.1	Tris(1-chloro-2-propyl)phosphate	13674-84-5					1.2E+04	2.8E+04		8.2E+03
2.3E+00	C	6.6E-04	C					V		4.7E+02	1.4E+09	9.0E+05	1		Tris(2,3-dibromopropyl)phosphate	126-72-7	1.4E+00		1.7E+01	1.3E+00				
2.0E-02	P			7.0E-03	P						1.4E+09		1	0.1	Tris(2-chloroethyl)phosphate	115-96-8	1.6E+02	3.9E+02		1.1E+02	8.2E+03	1.9E+04		5.7E+03
3.2E-03	P			1.0E-01	P						1.4E+09		1	0.1	Tris(2-ethylhexyl)phosphate	78-42-2	1.0E+03	2.4E+03		7.2E+02	1.2E+05	2.8E+05		8.2E+04
				8.0E-04	P						1.4E+09		1		Tungsten	7440-33-7					9.3E+02			9.3E+02
				2.0E-04	A	4.0E-05	A				1.4E+09		1		Uranium (Soluble Salts)	E715565					2.3E+02		2.4E+05	2.3E+02
1.0E+00	C	2.9E-04	C						M		1.4E+09		1	0.1	Urethane	51-79-6	3.3E+00	7.7E+00	5.7E+04	2.3E+00				
		8.3E-03	P	9.0E-03	I	7.0E-06	P				1.4E+09		0.026		Vanadium Pentoxide	1314-62-1			2.0E+03	2.0E+03	1.1E+04		4.2E+04	8.4E+03
				5.0E-03	S	1.0E-04	A				1.4E+09		0.026		Vanadium and Compounds	7440-62-2					5.9E+03		6.0E+05	5.8E+03
				1.0E-03	I			V			1.4E+09	1.2E+05	1		Vernolate	1929-77-7					1.2E+03			1.2E+03
				1.2E-03	O						1.4E+09		1	0.1	Vinclozolin	50471-44-8					1.4E+03	3.3E+03		9.8E+02
				1.0E+00	H	2.0E-01	I	V		2.8E+03	1.4E+09	4.4E+03	1		Vinyl Acetate	108-05-4					1.2E+06		3.9E+03	3.8E+03
		3.2E-05	H			3.0E-03	I	V		2.5E+03	1.4E+09	1.4E+03	1		Vinyl Bromide	593-60-2			5.2E-01	5.2E-01			1.8E+01	1.8E+01
7.2E-01	I	4.4E-06	I	3.0E-03	I	1.0E-01	I	V	M	3.9E+03	1.4E+09	9.6E+02	1		Vinyl Chloride	75-01-4	4.5E+00		2.7E+00	1.7E+00	3.5E+03		4.2E+02	3.7E+02
				3.0E-04	I						1.4E+09		1	0.1	Warfarin	81-81-2					3.5E+02	8.3E+02		2.5E+02
				2.0E-01	S	1.0E-01	S	V		3.9E+02	1.4E+09	5.6E+03	1		Xylene, P-	106-42-3					2.3E+05		2.4E+03	2.4E+03
				2.0E-01	S	1.0E-01	S	V		3.9E+02	1.4E+09	5.5E+03	1		Xylene, m-	108-38-3					2.3E+05		2.4E+03	2.4E+03
				2.0E-01	S	1.0E-01	S	V		4.3E+02	1.4E+09	6.5E+03	1		Xylene, o-	95-47-6					2.3E+05		2.8E+03	2.8E+03
				2.0E-01	I	1.0E-01	I	V		2.6E+02	1.4E+09	5.7E+03	1		Xylenes	1330-20-7					2.3E+05		2.5E+03	2.5E+03
				3.0E-04	I						1.4E+09		1		Zinc Phosphide	1314-84-7					3.5E+02			3.5E+02
				3.0E-01	I						1.4E+09		1		Zinc and Compounds	7440-66-6					3.5E+05			3.5E+05
				5.0E-02	I						1.4E+09		1	0.1	Zineb	12122-67-7					5.8E+04	1.4E+05		4.1E+04
				8.0E-05	X						1.4E+09		1		Zirconium	7440-67-7					9.3E+01			9.3E+01

Appendix D City and County of Denver – Guidance for Reuse of Soil on City Projects

Department of Environmental Health
Division of Environmental Quality
200 W 14th Ave, Suite 310
Denver, CO 80204
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INTEROFFICE MEMORANDUM

TO: City and County of Denver Department Executive Directors

FROM: Bob McDonald, Executive Director

DATE: October 05, 2017

SUBJECT: Guidance for Reuse of Soil on City Projects

There is increasing demand in and around the City and County of Denver (City) for soil available for reuse. Such reuse offers several benefits to the City including reduced waste, hauling costs, disposal fees, and vehicle emissions.

As the local public health authority, the City's Department of Environmental Health (DEH) has determined that all reusable soil must be adequately characterized based on the intended reuse to ensure the protection of public health and the environment. If the soil is not suitable for reuse per these guidelines, it must be disposed at the City-owned Denver Arapahoe Disposal Site (DADS) in accordance with the City's Executive Order No. 115.

This guidance provides criteria by which City employees and/or third parties may, or may not, reuse soil from City projects at both City-owned properties and properties owned by others. DEH sign off will be required for any reuse options. As such, to promote safe and sustainable reuse, it is within DEH's purview to implement the following requirements for City soils to be reused:

1. For onsite reuse, City personnel are responsible for contacting DEH[1] when they want to reuse soil or receive a request to reuse soil. DEH is responsible for promptly informing the requestor of City sampling frequency and analysis requirements based on contaminants of concern from recognized environmental conditions, which are designed to promote safe and sustainable reuse.

2. For off-site reuse and/or material to be imported to a site, the person or entity requesting to reuse the soil must adequately characterize the soil by sampling at least every 500 cubic

[1] Diane DeLillio, 720-865-5448, diane.delillio@denvergov.org

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yards to be excavated (or alternative frequency as determined by DEH) and analyze those soil samples for, at a minimum:

a. Volatile organic constituents;
b. Semi-volatile organic constituents;
c. Total petroleum hydrocarbons;
d. Pesticides;
e. Herbicides;
f. Polychlorinated biphenyls (PCBs);
g. Arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver; and
h. Asbestos – if debris is found and if suspect asbestos-containing material is found in the debris (e.g., transite, ash, brick mortar, asphalt shingles, etc.)

3. In general, the person or entity requesting to reuse the soil shall pay all costs associated with the sampling and analysis of the soil.

4. Before the City will release the soil for reuse, the party requesting the excess soil must indicate the land use of the accepting site and demonstrate to DEH's satisfaction that the soil meets the criteria based on the designated land use of the receiving site. See Exhibit 1 for additional guidance.

5. Maintain the documentation for sample collection, analytical results, and the environmental consultant's field notes and evaluation.

6. Any third party will be required to sign a release to accept the soil from the City and to release the City from liability.

Attachments: Exhibit 1 – Soil Reuse Acceptance Criteria Guidance Table
Exhibit 2 - Draft Release for Third Party Acceptance

CC: Jessica Brody, CAO
Lee Zarzecki, CAO
Zachery Clayton, DEH
Gregg Thomas, DEH

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THE MILE HIGH CITY

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Exhibit 1 - Soil Reuse Acceptance Criteria Guidance Table

Land Use	Examples	Applicable Soil Reuse Acceptance Criteria*
Recreational	Parks, Open Space	All Contaminants except Arsenic (Residential) Arsenic Standard
Residential	Single Family, Multi-family, Mixed-use with residential component	All Contaminants except Arsenic (Residential) Arsenic Standard
Right of Ways (not inclusive of utilities)	Roads, sidewalks, bike paths	All Contaminants except Arsenic (Composite Worker) Arsenic Standard
Utility corridors (underground)	Storm water, Waste water,	All Contaminants except Arsenic (Composite Worker) Arsenic Standard
City-owned facilities	Maintenance garages, office buildings, safety buildings	All Contaminants except Arsenic (Composite Worker) Arsenic Standard

* Screening values presented in the Regional Screening Levels table are based on human health risk from the combined exposure of direct soil ingestion, dermal contact with soil and inhalation of vapors or particulates associated with soil. Other pathways, such as indoor air or groundwater protection, may need to be considered on a site-specific basis. Some sites in sensitive ecological settings may need to be evaluated for potential ecological risk. These screening levels may not be applicable to sites within and/or subject to other regulatory programs (i.e., RCRA Corrective Action, Leaking Underground Storage Tanks, Superfund Operable Unit, etc.)

In addition, the reuse of any regulated asbestos-containing soil ("RACS") or suspect-RACS must be conducted in accordance with state regulations governing the management of RACS, 6 CCR 1007-2, § 5.5.

DEH is committed to assisting all agencies and projects to perform soil disturbing activities in a cost-effective and sustainable manner while ensuring protection of public health and the environment.

PRIVILEGED AND CONFIDENTIAL/ATTORNEY WORK PRODUCT

AGREEMENT AND RELEASE FOR EXCESS SOIL REUSE

This Agreement and Release ("Agreement") is made by and between _____ (the "Accepting Party") and the City and County of Denver (the "City") (collectively, the "Parties").

RECITALS

WHEREAS, the City has determined that it has excess soil available; and

WHEREAS, the Accepting Party has requested excess soil from the City for reuse at ___[address of reuse location]___; and

WHEREAS, the Accepting Party has sampled and analyzed the excess soil and determined it to be suitable for the intended reuse; and

NOW, THEREFORE, in consideration of the premises and agreements contained herein, the Parties agree as follows:

1. Recitals Binding. The Parties agree that the Recitals stated above are an integral part of the Agreement and are binding.

2. Conveyance of Ownership. The City agrees to convey to the Accepting Party ownership of up to __[maximum volume]__ cubic yards of excess soil.

3. Acceptance "AS-IS". The Accepting Party acknowledges that the City has made no representations or warranties regarding the environmental or geotechnical suitability of the excess soil. The Accepting Party acknowledges that it is assuming ownership of the excess soil based solely on its analysis of the soil. The Accepting Party accepts the excess soil "AS IS."

4. Payment. The Accepting Party shall pay to the City good and valuable consideration in the amount of TEN DOLLARS ($10.00), the sufficiency of which is hereby acknowledged.

5. Transportation to Receiving Site. The Accepting Party will transport, or arrange to transport, the excess soil from __[address]__ to the reuse location at a time, place, and manner acceptable to the City.

6. Defense and Indemnification

a. The Accepting Party agrees to defend, indemnify, reimburse and hold harmless City, its appointed and elected officials, agents and employees for, from and against all liabilities, claims, judgments, suits or demands for damages to persons or property arising out of, resulting from, or relating to the reuse of the excess soil, unless such Claims have been specifically determined by the trier of fact to be the sole negligence or willful misconduct of the City.

b. Accepting Party's duty to defend and indemnify City shall arise at the time written notice of the Claim is first provided to City regardless of whether Claimant has filed suit

on the Claim. Accepting Party's duty to defend and indemnify City shall arise even if City is the only party sued by claimant and/or claimant alleges that City's negligence or willful misconduct was the sole cause of claimant's damages.

c. Accepting Party shall defend any and all Claims which may be brought or threatened against City and shall pay on behalf of City any expenses incurred by reason of such Claims including, but not limited to, court costs and attorney fees incurred in defending and investigating such Claims or seeking to enforce this indemnity obligation. Such payments on behalf of City will be in addition to any other legal remedies available to City and will not be the City's exclusive remedy.

7. City Execution of Agreement. The Agreement will not be effective or binding on the City until it has been fully executed by all required signatories of the City and County of Denver, and if required by Charter, approved by the City Council.

8. Authority.

a. The Parties to this Agreement agree that each Party has authority to execute this Agreement.

b. The Parties to this Agreement have carefully read, and know and understand, the full contents of this Agreement and are voluntarily entering into this Agreement.

c. The Parties to this Agreement are competent to enter into this Agreement.

9. Governing Law and Venue. The Agreement will be construed and enforced in accordance with applicable federal law, the laws of the State of Colorado, and the Charter, Revised Municipal Code, ordinances, regulations and Executive Orders of the City and County of Denver, which are expressly incorporated into the Agreement. Unless otherwise specified, any reference to statutes, laws, regulations, charter or code provisions, ordinances, executive orders, or related memoranda, includes amendments or supplements to same. Venue for any legal action relating to the Agreement will be in the District Court of the State of Colorado, Second Judicial District (Denver District Court).

10. Entire Agreement: The Parties to this Agreement have not relied on any statement, representation, omission, inducement or promise of any other Party (or any officer, agent, employee, representative, or attorney for any other Party) in executing this Agreement, or in making the settlement provided for herein, except as expressly stated in this Agreement. The Agreement contains the entire understanding of the Parties relating to the subject matter of the Agreement. No promise, inducement or agreement which is not specifically provided in this Agreement has been made by any party to this Agreement, and no warranties, representations, or undertakings are made by the Parties hereto except as are expressly provided herein.

11. Electronic Signatures and Electronic Records. The Accepting Party consents to the use of electronic signatures by the City. The Agreement, and any other documents requiring a signature under the Agreement, may be signed electronically by the City in the manner specified by the City. The Parties agree not to deny the legal effect or enforceability of the Agreement solely because it is in electronic form or because an electronic record was used in its formation. The

Parties agree not to object to the admissibility of the Agreement in the form of an electronic record, or a paper copy of an electronic document, or a paper copy of a document bearing an electronic signature, on the ground that it is an electronic record or electronic signature or that it is not in its original form or is not an original.

[Remainder of the Page Intentionally Left Blank]

[Signature Pages Follow]

Appendix E CDPHE Table 3 – Pre-Approved Beneficial Reuses

Table 3		
Pre-Approved Beneficial Uses		**Conditions on Use**
Newly-Generated Coal Fly Ash	- component of concrete, mortar, brick, concrete masonry, wall grout, or manufactured stone	The beneficial use of coal fly ash must meet the engineering specification for the end use as well as specifications detailed in ASTM C618. Section 4 of Beneficial Use Table 2: Beneficial Use By Category and note 2 below also apply.
Solid Waste Regulations Section 10: Beneficial Use of Whole Waste Tires on Ag Land	- anchors - blowout stabilization - building material - bumpers for poles - corrals - drainage media substitute - effluent pond bank stabilization - equipment bumpers - feed source ballasts - fencing material - flower pots - irrigation line markers - livestock bumpers - livestock feeders - livestock scratcher - livestock sheds - pallet - pond and lake erosion control (calm water) - property boundaries - push carts - silage covers - tire drag or tire harrow - trespass signs - vegetation protection - water tanks - windbreaks	The beneficial use of whole waste tires on ag land must comply with Section 10.1.3(A)(5) of the Solid Waste Regulations 6 CCR 1007-2, Part 1.
Tire Bales	- containment - livestock sheds - windbreaks	The integrity of tire bales must be maintained while in use.
Waste Tire Treads	- matting	
Waste Tire Sidewalls	- construction barrel weights - feed source ballasts - silage covers	

Shredded Waste Tires	- drainage media substitute - landscape mulch - playground mulch - molded products - fuel source (with appropriate air permitting) - landfill alternative daily cover (when approved in D&O Plan) - lightweight aggregate (with an engineered plan)	
Waste Mining Tires	- livestock feeders - water tanks	
Waste Mining Tire Sidewalls	- ballasts - windbreaks	
Waste tire with one sidewall removed	- retaining wall - low volume gravel road - drainage control along gravel road - bike or walking path	Use of aggregate (rock, crushed concrete, reclaimed asphalt) inside a waste tire where only one sidewall is removed. Must meet an engineered specification or other specification for end use. Must meet all local ordinances and approvals, when required. Permits must be approved prior to construction, when required. Integrity of wall, road, drainage control, or path must be maintained at all times.
Reclaimed Asphalt	- road base - component of hot or cold mix asphalt - recompacted asphalt - roadside dressing - chip seal material - culvert cover - base stabilization - structural fill - mine backfill	The beneficial use of reclaimed asphalt must meet the engineering specification or other appropriate specification for the end use. See note 4. Mine backfill may only occur under a reclamation permit from the Division of Reclamation, Mining and Safety with the Colorado Department of Natural Resources.
Reclaimed Concrete, Brick, and Stone (non-asbestos bearing materials)	- road base - concrete aggregate - component of engineered structural backfill - aggregate substitute - engineered rip rap - road side dressing - mine backfill	The beneficial use of reclaimed concrete, brick, and stone must meet the engineering specification or other appropriate specification for the end use. See note 4. Mine backfill may only occur under a reclamation permit from the Division of Reclamation, Mining and Safety with the Colorado Department of Natural Resources.
Non chemically treated Wood	- mulch - bio-filter	

Glass (lead free)	- concrete aggregate - pavement aggregate - aggregate substitute - filter pavement	The beneficial use of lead-free glass must meet the engineering specification or other appropriate specification for the end use.
Clean reclaimed porcelain	- aggregate substitute	The beneficial use of clean reclaimed porcelain must meet the engineering specification or other appropriate specification for the end use.
Steel Slag	- aggregate substitute	The beneficial use of steel slag must meet the engineering specification or other appropriate specification for the end use.
Autofluff	- alternative daily cover for landfills (when approved in D&O Plan)	
Shredded paper/cardboard	- animal bedding - insulation	

Notes: 1. The Department has approved the beneficial uses specified in this table. A person may use wastes specified on this Pre-Approved Beneficial Use Table and meet the performance and storage standards listed in 6 CCR 1007-2, Part 1, Section 8.6.2 without prior approval from the Department, unless there is reason to believe the waste contains contaminants that exceed the Department approved unrestricted use concentrations that are protective of ground and surface water, or background constituent concentrations, or alternative criteria if required by the Department. Section 8.6.2, Performance and Storage Standards also specifies that *"The weight or volume of recyclable materials that are recycled shall be at least 90% of the total weight or volume (determined using a consistent measure) of recyclable materials received and currently in storage over a 3-year rolling average."*

2. The beneficial use of coal fly ash as a component of concrete must still be tested for metals from the beneficial use table 1B using the Synthetic Precipitation Leaching Procedure (SPLP) or Toxicity Characteristic Leaching Procedure (TCLP) and analytical results must be kept for 5 years at minimum. These results do not need to be reported to the Division annually but must be made available to the Division upon request. The pre-approved beneficial use of coal fly ash does not apply to historic stockpiles. The pre-approved uses identified in this table only apply to newly-generated ash.

3. All beneficial uses must meet all other local, state and federal requirements.

4. See the Division's compliance bulletin on the beneficial use and recycling of asphalt, brick, and concrete, available here: https://www.colorado.gov/pacific/cdphe/swguidance

Appendix F Remediation Activities Discharging to Surface Water Permit Information

COLORADO
Department of Public Health & Environment

Dedicated to protecting and improving the health and environment of the people of Colorado

For Agency Use Only:
Permit Number Assigned
COG07 - _____
COG315 -_____
COG316 -_____

Application for COLORADO DISCHARGE PERMIT SYSTEM (CDPS) General Permits:

- **Construction Dewatering** (COG070000)
- **Remediation Activities Discharging To Surface Water** (COG315000), or
- **Remediation Activities Discharging To Groundwater** (COG316000)

Please print or type. Original signatures are required. Photo, faxed, pdf or email copies will not be accepted.

This combined permit application is designed to streamline the application process for the three types of discharge permits listed in Part A below, and includes an *Application Guidance Document* to help applicants complete the application and select the right permit coverage for their activity. Please note that **one** application is intended to cover **one** project and **one** type of permit. Where multiple projects or types of permits are required, please submit an appropriate number of permit applications.

The application must be submitted to the Water Quality Control Division at least 30 days (for Construction Dewatering) or 45 days (for Remediation) prior to the anticipated date of discharge, and must be considered complete by the division before the review and approval process begins. The division will notify the applicant if additional information is needed to complete the application. If more space is required to answer any question, please attach additional sheets to the application form. Applications must be submitted by mail or hand delivered to:

Colorado Department of Public Health and Environment
Water Quality Control Division, WQCD-P-B2
4300 Cherry Creek Drive South
Denver, Colorado 80246-1530

***IMPORTANT**: Please read the Application Guidance Document (Guidance) for this permit application prior to completing this application. The Guidance provides specific and important instructions required for completing this application correctly.*

A. PERMIT INFORMATION

Reason for Application: □ NEW CERT

□ RENEW CERT EXISTING CERT # _____

Applicant is: □ Property Owner □ Contractor/Operator

Application is for the following discharge permit (select ONE). See Guidance.

□ Construction Dewatering (COG070000)

□ Remediation Activities Discharging to Surface Water (COG315000)

□ Remediation Activities Discharging to Groundwater (COG316000)

Note: This application is designed for processing each of the three permit types listed above. The division may request additional characterization of the proposed discharge to ensure that the appropriate permit coverage is requested and the appropriate permit certification is issued. The division may deny or change the requested type of discharge permit after review of the submitted application and will notify the applicant of the changes. Coverage under the "Subterranean Dewatering or Well Development" General Permit COG6030000 is not available using this application form.

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B. CONTACT INFORMATION

1. Permittee Information

Organization Formal Name: _____

Permittee Name: the person **authorized to sign and certify** the permit application. This person receives all permit correspondences and is **responsible** for ensuring compliance with the permit.

Responsible Position (Title): _____

Currently Held By (Person): _____

Telephone No: _____

Email address: _____

Mailing Address: _____

City: _____ State: _____ Zip: _____

This form must be signed by the permittee to be considered complete. **Per Regulation 61**, in all cases, it shall be signed as follows:

a) In the case of corporations, by a responsible corporate officer. For the purposes of this section, the responsible corporate officer is responsible for the overall operation of the facility from which the discharge described in the application originates.
b) In the case of a partnership, by a general partner.
c) In the case of a sole proprietorship, by the proprietor.
d) In the case of a municipal, state, or other public facility, by either a principal executive officer or ranking elected official.

2. DMR Cognizant Official (i.e. authorized agent) the person or position authorized to sign and certify reports required by permits including Discharge Monitoring Reports [DMR's], Annual Reports, Compliance Schedule submittals, and other information requested by the division. The division will transmit pre-printed DMR's to this person. If more than one, please add additional pages.

□ Same as 1) Permittee

Responsible Position (Title): _____

Currently Held By (Person): _____

Telephone No: _____

Email address: _____

Organization: _____

Mailing Address: _____

City: _____ State: _____ Zip: _____

Per Regulation 61: All reports required by permits, and other information requested by the Division shall be signed by the permittee or by a duly authorized representative of that person. A person is a duly authorized representative only if:

a) The authorization is made in writing by the permittee
b) The authorization specifies either an individual or **a position having responsibility for the overall operation of the regulated facility or activity** such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company. (A duly authorized representative may thus be either a named individual or any individual occupying a named position)
c) Submitted in writing to the Division

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B. CONTACT INFORMATION (cont.)

3. Site/Local Contact (contact for questions relating to the facility & discharge authorized by this permit.)

□ Same as 1) Permittee

Responsible Position (Title): _____

Currently Held By (Person): _____

Telephone No: _____

Email address: _____

Organization: _____

Mailing Address: _____

City: _____ State: _____ Zip: _____

4. Operator in Responsible Charge Required for Groundwater Remediation COG315000 or COG316000

□ Same as 1) Permittee □ Same as 3) Site/ Local Contact

**Note: Where the division determines that coverage under the construction dewatering permit is appropriate, an ORC is not required.*

Operator Number _____ Legal Name: _____

Telephone No: _____Email address: _____

Company: _____

5. Billing Contact □ Same as 1) Permittee

Responsible Position (Title): _____

Currently Held By (Person): _____

Telephone No: _____

Email address: _____

Organization: _____

Mailing Address: _____

City: _____ State: _____ Zip: _____

6. Other Contact Types (check below) Add pages if necessary:

Responsible Position (Title): _____

Currently Held By (Person): _____

Telephone No: _____

Email address: _____

Organization: _____

Mailing Address: _____

City: _____ State: _____ Zip: _____

□ Environmental Contact
□ Facility Inspection Contact
□ Consultant
□ Compliance Contact
□ Property Owner
□ Other _____

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C. PERMITTED FACILITY INFORMATION

Facility or Project Name _____

Street Address (or cross streets) _____

City_____ Colorado, Zip Code _____

County _____

Type of Facility Ownership

□ City Government □ Corporation □ Private □ Municipal or Water District

□ State Government □ Mixed Ownership _____

Facility or Project Latitude/Longitude — List the latitude and longitude of the excavation resulting in the discharge(s). If the exact excavation location(s) are not known, list the latitude and longitude of the center point of the construction project. If using the center point, be sure to specify that it is the center point of construction activity.

Latitude _____. _____ Longitude _____. _____
Provide coordinates in decimal degrees to 6 decimal places (e.g., 39.703345°,-104.933567°)

Horizontal Collection Method: □ GPS Unspecified □ Interpolation Map – Map Scale Number_____
Reference Point: □ Project/Facility Entrance □ Project/Facility Center/Centroid

Horizontal Reference Datum: _____

Standard Industrial Classification (SIC) Code(s) for this FACILITY (include up to 4, in order of importance)

1_____ 2_____3_____4_____

Receiving Water_____

D. PROJECT DESCRIPTION

D.1. Description of Activity:

a) Provide a brief overview of the project and dewatering activity (e.g., highway, bridge and tunnel construction, storm drain expansion, etc.).

b) Is the dewatering and discharge in-stream? (The dewatering operation is considered in-stream where the dewatering activity is conducted within approximately the ordinary high water mark of the stream and/or on the bank of the stream and the discharge is back to the same water body.)

□ Yes * □ No

**If yes, you must provide a description of how your project meets this definition in the box below. If no des cription is provided, the work will not be considered in-stream. Please note that in-stream work activities may also require a separate federal Clean Water Act Section 404 Permit and Colorado 401 Certification.*

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c) Will dewatering be conducted in areas that involve work on (e.g. replacing, repairing, making connections to, etc...) existing sanitary sewer lines, conveyances, or vessels, or in proximity to septic disposal systems?

□ Yes □ No

If yes, is there the potential that sewage or septage could be in the effluent to be discharged?

□ Yes □ No

D.2 Description of Discharge:

a) Is the discharge to a ditch or storm sewer system? □ Yes* □ No

**If yes, the applicant must contact the owner of the ditch or storm sewer system prior to discharging to address any local ordinances and to determine whether additional requirements will be imposed by the owner.*

b) Is the discharge to an impoundment? □ Yes* □ No

**If yes, note that discharge of contaminated groundwater to impoundments are regulated by the Solid Waste Program in the Hazardous Materials and Waste Management Division (HMWMD), and cannot be covered under either the Construction Dewatering or the Remediation Activities Discharging to Surface Water or Groundwater permits.*

c) Discharge Frequency and Duration:

- Estimated discharge start date: _____
- Estimated discharge duration: Years _____ Months _____ Days _____
- Upon completion of construction phase dewatering, will there be long-term subterranean dewatering at the site (e.g. foundation, footer, toe drains, etc...)? □ Yes* □ No

  **If yes, note that construction phase dewatering and long-term subterranean dewatering cannot be covered under the same permit certification.*

d) Description of Best Management Practices (BMPs):

Provide a narrative description of the type(s) of treatment used for each outfall in the box below.

D.3 Discharge Outfalls Limit 20 outfalls:

- Total number of **defined** outfalls requested: _____
- Total number of **undefined** outfalls requested:_____ (allowable for construction dewatering only)
- Complete Table 2a (for discharges to surface water) and/or 2b (for discharges to land with percolation to groundwater) to identify your defined and undefined outfall locations. Attach additional pages as necessary.

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Table 2a - Requested Outfalls for Discharges to Surface Water (Discharges that may reach surface water through direct discharge or through a conveyance such as a ditch or a storm sewer system)				
OUTFALL NUMBER[1]	**NAME OF RECEIVING STREAM(S)** (e.g., Cherry Creek, Boulder Creek, Arkansas River)	**ESTIMATED MAXIMUM FLOW RATE**[2] **(gpm)**	**DESCRIPTION OF DISCHARGE LOCATION**[3] (e.g., Discharge enters storm sewer located at the corner of Speer and 8th Ave. with flow to Cherry Creek)	**LATITUDE/LONGITUDE OF EACH DISCHARGE OUTFALL**
Defined Discharges to Surface Water				
001-A				
002-A				
003-A				
004-A				
Undefined Discharges to Surface Water *(Available for construction dewatering only) (Provide **estimated** lat/long only for undefined outfalls)*				
001-AU				
002-AU				
003-AU				
004-AU				

1 Identify up to 20 defined or undefined outfalls (undefined for construction dewatering only). Use additional pages as necessary.
2 For construction dewatering the maximum flow limit will be equal to twice the estimated maximum flow rate provided in the permit application. For groundwater remediation the 30-day average flow limit will be based on the design capacity of the treatment as provided in the permit application.
3 The discharge location is the point where effluent sampling will occur. This location must be at a point after treatment and before the effluent joins or is diluted by any other waste stream, body of water, or substance. If the discharge is to a ditch or storm sewer system, include the name of the ultimate receiving waters where the ditch or storm sewer discharges.

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Table 2b - Requested Outfalls for Discharges to Land with the Potential to Percolate to Groundwater (These discharges do not have the potential to reach surface water either directly or through a conveyance.)[4]			
OUTFALL NUMBER[1]	**ESTIMATED MAXIMUM FLOW RATE[2] (gpm)**	**DESCRIPTION OF DISCHARGE LOCATION[3]** (e.g., Discharge to a field south of project site and East of I-25)	**LATITUDE/LONGITUDE OF EACH DISCHARGE OUTFALL**
Defined Discharges to Land with Potential Percolation to Groundwater			
G001-A			
G002-A			
G003-A			
G004-A			
Undefined Discharges to Land with Potential Percolation to Groundwater *(Available for construction dewatering only) (Provide **estimated** lat/long only for undefined outfalls)*			
G001-AU			
G002-AU			
G003-AU			
G004-AU			

1 Identify up to 20 defined or undefined outfalls (undefined for construction dewatering only). Use additional pages as necessary.
2 For construction dewatering the maximum flow limit will be equal to twice the estimated maximum rate flow rate provided in the permit application. For groundwater remediation the 30-day average flow limit will be based on the design capacity of the treatment as provided in the permit application.
3 The discharge location is the point where effluent sampling will occur. This location must be at a point after treatment and before the effluent joins or is diluted by any other waste stream, body of water, or substance.
4 For discharges of uncontaminated groundwater to land, please review and consider the applicability of the division's *Low Risk Discharge Guidance: Discharges of Uncontaminated Groundwater to Land* before submitting a permit application to the division. This policy is available for download at https://www.colorado.gov/pacific/cdphe/clean-water-construction-compliance-assistance-and-guidance.

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E. ADDITIONAL INFORMATION

E.1 Nearby Sources of Potential Groundwater Contamination:

a) Has the proposed dewatering area been reviewed for possible groundwater contamination, such as plumes from leaking underground storage tanks (LUSTs), hazardous waste sites, or additional sources other than what is normally encountered at excavation and construction sites? *Applicants are expected to exercise due diligence in evaluating their project sites prior to applying for a discharge permit.*

□ Yes □ No

b) Is an open LUST located within **one-half mile** of the site?

□ Yes* □ No

**If yes, BTEX analytical data for a source water sample representative of the proposed discharge at the site must be included with the permit application. Failure to include this data may result in delays in processing the permit application until such data is submitted to the Division. See Guidance.*

c) Is a Superfund site or National Priorities List (NLP) site located within **one mile** of the site?

□ Yes* □ No

**If yes, analytical data for all parameters shown in Table 1 of this application (or an alternate list of constituents approved by the division) for a source water sample representative of the proposed discharge must be included with the permit application. Failure to include this data may result in delays in processing the permit application until such data is submitted to the Division. See Guidance.*

d) Is any other (non-LUST, non-Superfund, non-NPL site) known source of contamination, such as a Voluntary Cleanup (VCUP), Environmental Covenant, open RCRA Corrective Action site, or brownfields site located within one-half mile of the site?

□ Yes* □ No

**If yes, analytical data for all parameters shown in Table 1 of this application (or an alternate list of constituents approved by the division) for a source water sample representative of the proposed discharge must be included with the permit application. Failure to include this data may result in delays in processing the permit application until such data is submitted to the Division. See Guidance.*

e) If known sources of contamination are located near the site, provide an overview of the source and nature of contamination including:

- The nature of the contamination of the groundwater, alluvial water, stormwater, and/or surface water (the source water) for which treatment and/or remedial activities will occur,
- The primary industrial activities which resulted in the source water contamination,
- The source of the contamination (pipes, leaking underground storage tank, up gradient sources, etc.) or state "unknown."

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f) For contaminated discharges (remediation), provide a narrative description of the type(s) of treatment proposed for use at each identified outfall.

E.2 Chemical Additions

List any chemical additives or other materials to be used in the water or to treat water prior to discharge. Include the Material Safety Data Sheet (MSDS) for each chemical with the application.

CHEMICAL NAME	MANUFACTURER	PURPOSE	DOSAGE

E.3 Site Maps and Schematics

Are required maps and schematics attached? □ Yes
□ No-Application cannot be processed without required maps

- ✓ **A Location Map for Defined Outfalls** – Application must include a location map that shows the location of the project/facility, the location of the defined discharge point(s)/outfalls, and any receiving water(s). If known, the map should also include the approximate location(s) where dewatering is to occur, approximate location of undefined discharge points(s), and location of proposed BMP(s) to be used. A north arrow must be shown. **This map must be on paper that can be folded to 8 ½ x 11 inches.**

- ✓ **A Legible Site Sketch** must be submitted that includes detailed site boundary information including street names or mile markers, the location of dewatering or remediation activities, all defined discharge points, and sampling locations. For undefined discharges (allowed for construction dewatering projects only), the site sketch must include the limits of the construction site boundary and the location of potential receiving waters. **This map must be on paper that can be folded to 8 ½ x 11 inches.**

E.4 Associated Permits

Does the applicant have a Stormwater Permit for Construction Activities? □ YES □ NO □ PENDING
If Yes, Stormwater Construction Permit Number: COR-_____

Does the applicant have a Clean Water Act Section 404 Permit? □ YES □ NO □ PENDING

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E.5 Water Rights

The State Engineers Office (SEO) has indicated that any discharge that does not return water directly to surface waters (i.e. land application, rapid infiltration basins, etc.) has the potential for material injury to a water right. As a result, the SEO needs to determine that material injury to a water right will not occur from such activities. To make this judgment, the SEO requests that a copy of all documentation demonstrating that the requirements of Colorado water law have been met, be submitted to their office for review. The submittal should be made as soon as possible to the following address:

Colorado Division of Water Resources ● 1313 Sherman Street, Room 818 ● Denver, Colorado 80203

Should there be any questions on the issue of water rights; the SEO can be contacted at (303) 866-3581. It is important to understand that any CDPS permit issued by the division does not constitute a water right. Issuance of a CDPS permit does not negate the need to also have the necessary water rights in place. It is also important to understand that even if the activity has an existing CDPS permit, there is no guarantee that the proper water rights are in place.

F. REQUIRED CERTIFICATION SIGNATURE [Reg 61.4(1)(h)]

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

Signature (Legally Responsible Party (Page 2 item 1) _____

Date _____

Name (printed) _____Title_____

This form must be signed by the permittee to be considered complete. **Per Regulation 61**, in all cases, it shall be signed as follows:

a) In the case of corporations, by a responsible corporate officer. For the purposes of this section, the responsible corporate officer is responsible for the overall operation of the facility from which the discharge described in the application originates.
b) In the case of a partnership, by a general partner.
c) In the case of a sole proprietorship, by the proprietor.
d) In the case of a municipal, state, or other public facility, by either a principal executive officer or ranking elected official.

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John W. Hickenlooper, Governor | Larry Wolk, MD, MSPH, Executive Director and Chief Medical Officer

ATTACHMENT 1
Please Submit the Laboratory Data Package for any Required Analysis with the Permit Application
(See Important Table Notes)

Required Water Quality Data			
Metals	**PQL (ug/l) [1]**	**Metals**	**PQL (ug/l) [1]**
Aluminum-Trec	15	Lead-PD	0.5
Antimony-Trec	2	Manganese-PD	2
Arsenic-Trec	1	Manganese-Diss	2
Arsenic-PD	1	Molybdenum-Trec	0.5
Barium-Trec	1	Nickel-Trec	1
Beryllium-Trec	2	Nickel-PD	1
Cadmium-Trec	0.5	Selenium-Trec	1
Cadmium-PD	0.5	Selenium-PD	1
Chromium III-Trec	20	Silver-Trec	0.5
Chromium III-PD	20	Silver-PD	0.5
Chromium VI-Trec	20	Thallium-Trec	0.5
Chromium VI-Diss	20	Thallium-PD	0.5
Copper-Trec	2	Uranium-PD	1
Copper - PD	2	Uranium-Trec	1
Iron-Trec	20	Zinc-Trec	10
Iron-Diss	20	Zinc-PD	10
Lead-Trec	0.5		
Volatiles	**PQL (ug/l) [1]**	**Volatiles**	**PQL (ug/l) [1]**
acrolein	15	ethylbenzene	75
benzene	3	methyl bromide	5
bromoform	3	methyl chloride	4.5
carbon tetrachloride	3	1,1,2,2-tetrachloroethane	2
chlorobenzene	60	tetrachloroethylene	2.3
chlorodibromomethane	3	toluene	60
2-chloroethylvinyl ether	0.65 *	1,2-trans-dichloroethylene	0.5 *
chloroform	3	1,1,1-trichloroethane	5
1,2-dichlorethane	3	1,1,2-trichloroethane	2.0
1,1-dichlorethylene	5	trichloroethylene	2.3
1,2-dichlorpropane	2	vinyl chloride	3
1,3-dichlorpropylene	2 *	1,4-Dioxane	0.15 *
Semi-Volatile Organic Compounds	**PQL (ug/l) [1]**	**Semi-Volatile Organic Compounds**	**PQL (ug/l) [1]**
acenaphthene	20	1,2-diphenylhydrazine (as azobenzene)	5 *
acenaphthylene	30	fluorene	20
anthracene	20	fluoranthene	25
benzidine	170	hexachlorobenzene	16
benzo(a)anthracene	12	hexachlorobutadiene	9
benzo(a)pyrene	20	hexachlorcyclopentadiene	50
benzo(b)fluoranthene	35	hexachloroethane	16
benzo(ghi)perylene	20	indeno(1,2,3-cd)pyrene	20
benzo(k)fluoranthene	25	isophorone	25
bis(2-chloroethyl)ether *(or Dichloroethyl ether)*	15	naphthalene	20
bis(2-chloroisopropyl)ether *(or 2,2-dichloroisopropyl ether)*	60	nitrobenzene	19
bis(2-ethylhexyl)phthalate	25	N-nitrosodimethylamine	30

Semi-Volatile Organic Compounds	PQL (ug/l) [1]	Semi-Volatile Organic Compounds	PQL (ug/l) [1]
Butyl benzyl phthalate	25	N-nitrosodi-n-propylamine	30
2-chloronaphthalene	20	N-nitrosodiphenylamine	19
chrysene	18	pyrene	10
dibenzo(a,h)anthracene	20	1,2,4-trichlorobenzene	20
1,2-dichlorobenzene	2.5	2-chlorophenol	35
1,3-dichlorobenzene	2.5	2,4-dichlorophenol	30
1,4-dichlorobenzene	3.5	2,4,-dimethylphenol	30
3,3-dichlorobenzidine	18	4,6-dinitro-o-cresol	17
diethyl phthalate	20	2,4-dinitrophenol	100
dimethyl phthalate	20	4-nitrophenol	25
di-n-butyl phthalate	25	pentachorophenol	36
2,4-dinitrotoluene	17	phenol	15
2,6-dinitrotoluene	20	2,4,6-trichlorophenol	25
xylene	10 *	1,4-Dioxane	0.15 *

[1] PQLs are as listed in the division's *Practical Quantitation Limits Policy* (CW 6) unless noted otherwise.

* This is a recommended PQL based on EPA approved methods. The division's *Practical Quantitation Limits Policy (CW 6)* does not provide a 40 CFR 136 based PQL for this parameter.

Trec = Total Recoverable

PD = Potentially Dissolved

Diss = Dissolved

PQL = Practical Quantitation Limit

Important table notes:

1) Please refer to the permit application Guidance to determine whether analytical data is required with the permit application, and if so, what specific type of data is required.

2) Parameter names match the names as they appear in the general permit or, as italicized, as they appear in the division's *Practical Quantitation Limits Policy* (CW-6).

3) The division may require analytical data for additional parameters where the project site is located in close proximity to potential sources of contamination for parameters not included in this Attachment 1, including but not limited to pesticide, PCB, radionuclide contamination.

4) Applicants applying under the General Permit for Remediation Activities Discharging to Groundwater (COG316000) are encouraged to contact the division prior to sample collection to ensure that the correct metal speciation is included in the sample analysis.

5) For the permit application, all sampling should be performed according to specified methods in 40 CFR 136, methods approved by EPA pursuant to 40 CFR 136, or methods approved by the division, in the absence of a method specified in or approved pursuant to 40 CFR 136. In addition, the PQLs listed in Attachment 1 should be met unless otherwise approved by the division.

COLORADO
Department of Public Health & Environment

Dedicated to protecting and improving the health and environment of the people of Colorado

APPLICATION GUIDANCE DOCUMENT

COLORADO DISCHARGE PERMIT SYSTEM (CDPS) General Permits:

- **Construction Dewatering** (COG070000)
- **Remediation Activities Discharging To Surface Water** (COG315000), or
- **Remediation Activities Discharging To Groundwater** (COG316000)

Contents

This guidance is designed to assist in completing the application for processing each of the three permit types listed above. The Water Quality Control Division may request additional information and characterization of the proposed discharge to ensure that the appropriate permit coverage is requested and the appropriate permit certification is issued. The division may deny or change the requested type of discharge permit after review of the submitted application and will notify the applicant of the changes. Please note:

- Coverage under the "Subterranean Dewatering or Well Development" General Permit (COG6030000) is not available using this permit application form.
- The discharge of contaminated groundwater to an impoundment is regulated by the Solid Waste Program in the Hazardous Materials and Waste Management Division, and also cannot be covered under any of the above permits.
- The discharge of uncontaminated groundwater to land may be discharged under the division's *Low Risk Discharge Guidance: Discharges of Uncontaminated Groundwater to Land* as an alternative to obtaining coverage to discharge under this permit. The low risk policy is available for download at www.coloradowaterpermits.com.
- As provided in General Permit COR030000, the discharge of uncontaminated groundwater to land may also be discharged under an exisiting construction stormwater permit where permit conditions are met.

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A. PERMIT INFORMATION

Reason for Application: Indicate whether this is an application for a new certification or if you are renewing an existing certification (as required prior to the expiration date of an existing general permit or certification). If you are renewing an existing certification, please provide the existing permit certification number.

Applicant is: Indicate the entity that will hold (be legally responsible for) the permit.

Application is for the following discharge permit (select ONE): In order to determine whether your project qualifies for coverage under a construction dewatering general permit (COG070000) or requires a remediation general permit (COG315000 or COG316000), you must determine whether there are known sources of groundwater contamination located in the vicinity of your project site. Where nearby sources of groundwater contaminations are identified, you will need to determine whether your project has the potential to draw-in contaminated groundwater. The best way to make this determination is to use the criteria in Table 1 below to determine if your project site is located in the vicinity of potential ground water contamination. If so, collect a sample of groundwater from your project site (i.e., water that is representative of the water you propose to discharge). Then, use Table 1 to determine what parameters to include in your analysis, have it analyzed for those parameters described, and submit the data with your permit application.

Table 1: Locations of Potential Groundwater Contamination

Is Your Project Site Located in the Vicinity of Potential Groundwater Contamination? [1]	
Project Location Relative to a Source of Potential Groundwater Contamination	**Analytical Data Likely to be Required with the Permit Application**
Within **0.5 mile** of an open Leaking Underground Storage Tank (LUST) site *(Note that closed LUSTs are assumed to pose a low risk for potential groundwater contamination and, therefore, the submission of analytical data based on proximity to a closed LUST is not required)*	BTEX only
Within **0.5 mile** of an open Voluntary Cleanup (VCUP) site	All parameters listed in Attachment 1 of the permit application (or an alternate list approved by the division)[2]
Within **0.5 mile** of an Environmental Covenant	
Within **0.5 mile** of an open Resource Conservation Recovery Act (RCRA) Corrective Action Site	
Within **1.0 mile** or more of a Superfund site or National Priorities List (NPL) site with associated groundwater contamination	

1 This table provides examples of sources of contamination. Other types and sources of potential groundwater contamination may exist.

2 Analyze a groundwater sample that is representative of the water you propose to discharge for the parameters of concern for the project areas (i.e., total, dissolved, potentially dissolved). This may be a subset of Attachment 1 in the permit application. Note this subset list must be approved by the division. See Important Notes in Appendix A at the end of this guidance for more information on this topic.

Information regarding the locations of the various types of contaminated sites (LUST, VCUP, Environmental Covenants, RCRA Corrective Action, or Superfund) may be found in Appendix B of this document.

Once you have determined if your project site is located in the vicinity of potential groundwater contamination, use the **flowchart** on the following page to help determine the appropriate permit coverage for your discharge.

Table 2 below supplements the selection process by providing possible groundwater contamination scenarios and general permit descriptions and coverage. Select the one type of permit coverage most appropriate for this project. Please note that one application is intended to cover one project and one type of permit. Where multiple projects or types of permits are required, you must submit an appropriate number of permit applications.

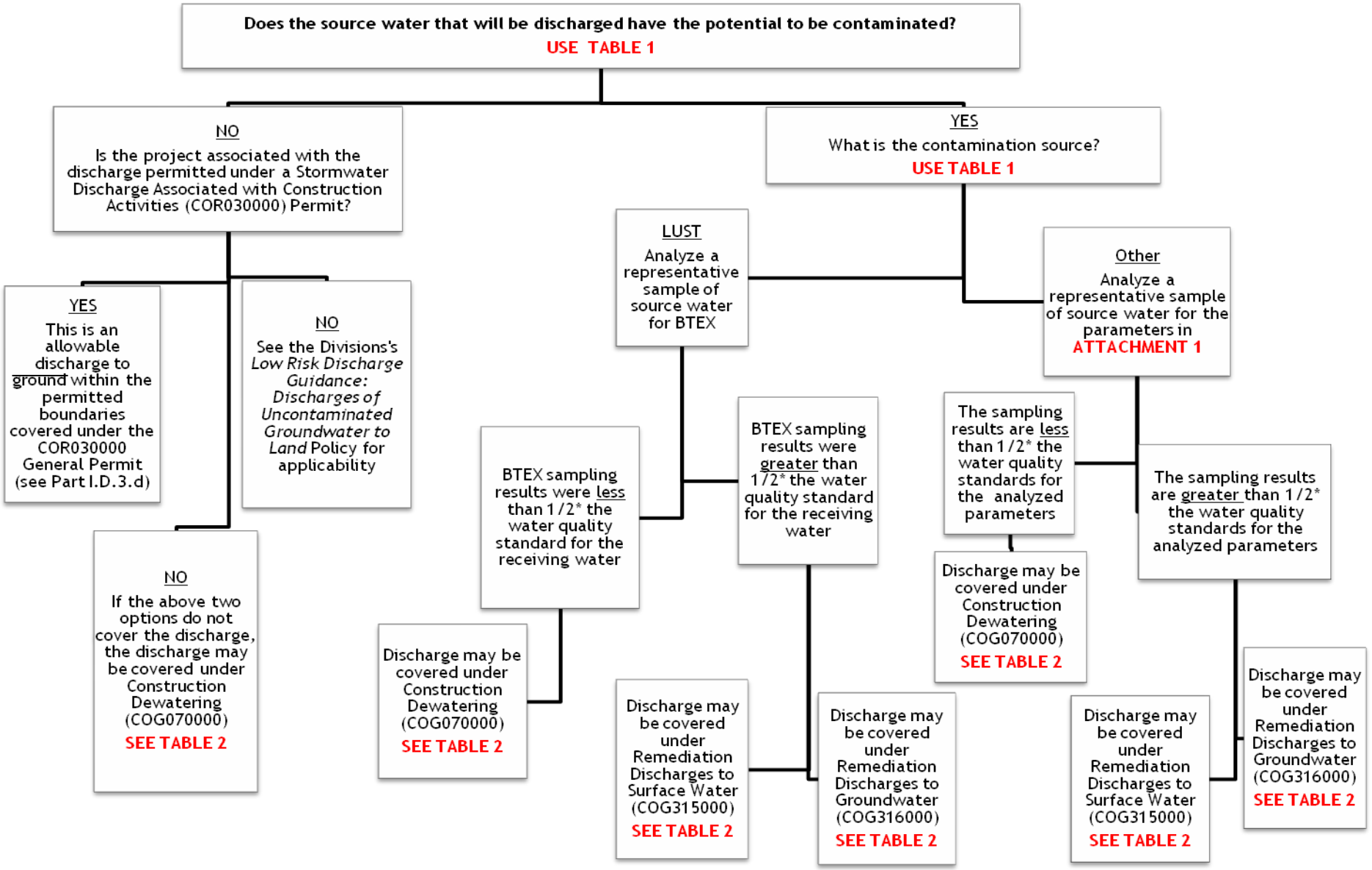
Table 2: General Permit Descriptions and Information[1]

	Construction Dewatering (COG70000)	**Remediation Activities Discharging to Surface Waters (COG315000)**	**Remediation Activities Discharging to Ground Water (COG316000)**
Covered Discharges	Uncontaminated source water OR Contaminated (by BTEX only) source water[2] that has come into contact with construction activities	Discharges from treatment and/or remedial activities of contaminated groundwater, alluvial water, stormwater, and/or surface water (which may be associated with construction activities)	Discharges from treatment and/or remedial activities of contaminated groundwater, alluvial water, stormwater, and/or surface water (which may be associated with construction activities)
Discharge Location	To surface water and/or to land with potential percolation to groundwater	To surface water or land with potential percolation to groundwater hydrologically connected to surface water	To land with the potential to percolate to groundwater not hydrologically connected to surface water
Applicant Requirements	BTEX[3] Analysis (if within one half mile of an open LUST)	Influent Screening[4]	Influent Screening
Division Authorization	Discharges under this permit will not be authorized if pollutants may be present in the source water in concentration greater than a numeric water quality standard of the receiving water	Discharges under this permit may be authorized if pollutants may be present in the source water in concentration greater than a numeric water quality standard of the receiving water	Discharges under this permit may be authorized if pollutants may be present in the source water in concentration greater than a numeric water quality standard of the receiving water

1 The Division may deny or change the requested type of discharge permit after review of the submitted application and will notify the applicant of the changes.
2 Source Water: Groundwater, surface water, alluvial water, or stormwater mixed with groundwater and/or surface water
3 BTEX: Benzene, Toluene, Ethylbenzene, and Xylene (BTEX) are common pollutants found in petroleum based products
4 See Attachment 1 in the permit application packet

Additional information and resources for identification of contaminated groundwater and sampling procedures can be found in this guidance document:

- APPENDIX A: Information for Completing Analyticals Required
- APPENDIX B: Resources for Determining Groundwater Contamination Potential
- APPENDIX C: Division Determination Using the Application Information and Data



*One-half the water quality standard is a general comparison. This may vary on a case by case basis resulting in different permit coverage than what is stated above.

B. CONTACT INFORMATION

Provide the required contact information. Note that the person listed as the *Permittee* (Responsible Position) must also be the person that signs and certifies the permit application. This person receives all permit correspondences and is legally responsible for compliance with the permit.

Note that the person listed as the *DMR Cognizant Official* will receive all pre-printed discharge monitoring report (DMR) forms associated with the permit.

C. PERMITTED FACILITY INFORMATION

Provide the required facility information.

Facility or Project Latitude/Longitude: The following definitions are based on text from the EPA Data Standard.

- Horizontal Collection Method: Describes the method used to determine the latitude and longitude coordinates for a point on the earth. This specifies what type of method or device was used to identify the latitude and longitude, e.g., a Global Positioning System (GPS) device, Google Earth, an address, an intersection, a census block centroid, etc. The key is that the horizontal collection method determines how the coordinates were collected, not where.

- Reference Point: The text that identifies the place for which the geographic coordinates were established. This specifies the location at the place where the coordinates were taken, e.g., entrance to a facility, center of a facility, etc. The key is that the reference point determines where the coordinates were collected, not how.

- Horizontal Reference Datum: The horizontal reference datum is the coordinate reference system to which the latitude/longitude data relate. Per EPA's *Latitude/Longitude Data Standard*, there are three possible values associated with horizontal reference datum. Horizontal reference datum possible responses are as follows:

    - North American Datum of 1927 (**NAD27**): If you are reporting a location using a USGS 7.5-minute map, NAD27 is your default datum.

    - North American Datum of 1983 (**NAD83**): NAD83 updated NAD27 with current measurements using radio astronomy and satellite observations. When the USGS began publishing digital data, the NAD83 was used, which provided a more accurate representation of the earth's shape and a more accurate depiction of the location of objects on the earth.

    - World Geodetic System of 1984 (**WGS84**): If you used a GPS or Google Earth to calculate your latitude/longitude coordinates, WGS84 is the default datum.

Standard Industrial Classification (SIC) Code(s) for this Facility: Standard Industrial Classification (SIC) codes are four digit numerical codes assigned by the U.S. government to business establishments to identify the primary business of the establishment. SIC codes can be obtained at: https://www.osha.gov/pls/imis/sicsearch.html. The most common SIC code for businesses conducting construction-related work is **1799: Special Trade Contractors, Not Elsewhere Classified.** This includes dewatering contractors.

D. PROJECT DESCRIPTION

D.1 Description of Activity and **D.2 Description of Discharge**: Provide thorough and detailed responses to the questions in these sections in order to facilitate and expedite the review and processing of your application.

Note that "in-stream" work is:

- Conducted within approximately the ordinary high water mark* of the stream, and/or
- Conducted on the bank of the stream, and
- potentially including subsurface flow to the stream.

* "The term *ordinary high water mark* means that line on the shore established by the fluctuations of water and indicated by physical characteristics such as a clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding area."

(Taken directly from USACE Regulatory Guidance Letter "Ordinary High Water Mark Identification" dated 12/07/2005)

D.3 Discharge Outfalls: Discharge "outfalls" refer to the physical location where the discharge occurs. This discharge location may be different from the source water location. For example, you may dewater your project site by pumping water from the excavation (the source) to the nearby stream (the outfall). This portion of the permit application requires information regarding your outfall location(s).

What is a defined outfall versus an undefined outfall?

The permit application requires that you specify whether the outfall is defined or undefined.

- A defined outfall has a known location, specified by latitude and longitude at the time of permit application. Where defined outfalls are requested, the division will mail DMRs that include the specified location information. Permittees often find this information helpful in managing their DMRs, and submitting the correct DMR form for the outfall location.
- An undefined outfall has an unknown location at the time of permit application. Undefined outfalls are only available for construction dewatering (COG07000, Part I.B.1). In this case the specific location for each discharge is established by the permittee at the time the discharge commences, and may not be changed once established. Permittees are responsible for making sure that the same DMR (for example the DMR labeled "Outfall 001A") is always used for the same outfall sampling location. A single DMR cannot be used for multiple locations in the field. Undefined outfalls provide flexibility during construction activities; however, they may be difficult to manage and the most stringent water quality standards for all potentially impacted streams are applied to all discharge outfalls.

What is the maximum number of outfalls that I can request?

You are allowed to request up to 20 defined outfalls and 20 undefined outfalls in one permit application. Undefined outfalls are only available for construction dewatering. Where your project requires additional outfalls, you may request a modification to your permit certification to add additional outfalls.

Is this a discharge to surface water or to land with the potential to percolate to groundwater?

The permit application requires that you specify whether the outfall is a discharge is to surface water or to land with the potential to percolate to ground water.

- A discharge to surface water can occur directly or through a conveyance such as a ditch or a storm sewer system.
- A discharge to groundwater occurs through land application and/or through discharge to a sediment basin with percolation to groundwater.
- If your discharge is to a sediment basin and the basin overtops, the division may determine that your discharge is to both surface water and groundwater, and will include appropriate permit limitations for both surface water and groundwater in your permit certification.

How do I estimate the maximum flowrate?

The estimated maximum discharge flow rate must be provided in order for the division to process the permit application. In order to estimate your maximum flow rate, you might consider the maximum capacity of the pumps at your site and the total number of pumps that can be operating together at one excavation. For stream diversions, you might estimate the maximum flow rate of the stream around your work activity. For remediation projects where treatment is in place, estimate the maximum flow rate appropriate for your treatment system. The Division will apply your flow information in your permit certification as follows:

- For construction dewatering, the acute flow limit (i.e., maximum flow limitation) will be equal to twice the estimated maximum rate flow rate provided in the permit application.
- For groundwater remediation, both the acute flow limit (i.e., maximum flow limitation) and the chronic flow limit (i.e., 30-day average flow limitation) will be based on the design capacity of the treatment as provided in the permit application.

Where will the sampling occur?

Per the general permit, discharge points shall be designed or modified so that a sample of the effluent can be obtained at a point after the final treatment process and prior to discharge to state waters. All samples must be taken at the monitoring points specified in this permit and, unless otherwise specified, before the effluent joins or is diluted by any other waste stream, body of water, or substance. Monitoring points cannot be changed without notification to and approval by the division. The permittee must provide access to the division to sample the discharge at these points.

E. ADDITIONAL INFORMATION

E.1 Nearby Sources of Potential Groundwater Contamination: In this portion of the application, you are required to document the results of your due diligence efforts, including whether or not you identified potential sources of groundwater contamination in the vicinity of your project. Information to help you complete this portion of the application was provided in the flowchart and tables above, as well as in Appendix A-C of this guidance document.

E.2 Chemical Additions: List any chemicals to be used in, or applied to, waters that may be discharged. Include a copy of each chemical's current Material Safety Data Sheet. All chemicals used in waters that may be discharged must be approved by the division.

E.3 Site Maps and Schematics: The complete application must include these maps and site sketches.

WATER RIGHTS

The permittee is responsible for contacting the State Engineers Office as appropriate. Issuance of a CDPS permit does not negate the need to also have the necessary water rights in place. It is also important to understand that even if the activity has an existing CDPS permit, there is no guarantee that the proper water rights are in place.

F. REQUIRED CERTIFICATION SIGNATURE [Reg. 61.4(1)(h)]

The application must be signed by the responsible party in order to be processed by the Division. An original (wet) signature is required on the permit application submitted to the division.

APPENDIX A: Information for Submitting Required Data

A list of required parameters to be sampled for is found in Attachment 1 of the permit application. (See important notes.)

Unless otherwise indicated by the division, all influent screening must adhere to the following stipulations:

- Metals analyses must be performed for the analytical form (total recoverable, potentially dissolved, and/or dissolved) identified in Attachment 1 of the permit application.
- Analytical methods for metals must measure below or equal to the practical quantitation limit (PQL) identified in Attachment 1 of the permit application.
- Analytical methods and PQLs selected for all parameters must be in accordance with the criteria established in the permit application.
- The sample collected must be representative of the source water.

IMPORTANT NOTES:

- **Alternate List of Parameters:** Where the applicant can identify the parameters associated with the source of potential groundwater contamination, the applicant may contact the division to request approval to analyze only for those parameters, and to submit data for only those parameters with the permit application.
- In lieu of submitting analytical data, you may choose to demonstrate that your site is not likely to be impacted by nearby sources of contamination by submitting other relevant information with your permit application for review and consideration by the division. For example, you may submit information regarding the geology and hydrogeology of the site, groundwater flow direction, or historic groundwater data. This information must be accompanied by a narrative discussion of how and why this information shows that groundwater at your project site is not likely to be contaminated. The division will review this information, and determine if it is sufficient to demonstrate that groundwater at the site is not likely to be contaminated. Where the division finds the information to be insufficient, the division will require additional data or information, potentially delaying the processing of the permit.
- Applicants applying under the General Permit for Remediation Activities Discharging to Groundwater (COG316000) are encouraged to contact the division prior to sample collection to ensure that the correct metal speciation is included in the sample analysis.

APPENDIX B: Resources for Determining Groundwater Contamination Potential

The following resources are available for determining if contaminated groundwater may be located near your project site:

- **Leaking Underground Storage Tanks (LUSTs):** Oil and Public Safety (OPS) COSTIS database (Storage Tank Database). Search for events by city, county, or zip code on the OPS website.
  - https://www.colorado.gov/pacific/ops/PetroleumMaps

- **Superfund Sites:** The CDPHE HMWMD maintains a list of active Superfund sites on its website. The division may require data even if your site is greater than one-mile from a Superfund site, based on the nature and extent of contamination at these sites.
  - https://www.colorado.gov/pacific/cdphe/superfund-sites
  - https://www.colorado.gov/pacific/cdphe/hm-gis-data

- **National Priorities List (NPL) sites:** The U.S. Environmental Protection Agency maintains a list of national priorities sites on their website.
  - https://www.epa.gov/superfund/national-priorities-list-npl-sites-state#CO

- **Voluntary Cleanup Sites (VCUPs):** The CDPHE Hazardous Materials and Waste Management Division (HMWMD) maintains a list of VCUPs by County. Visit the HMWMD website, and select the "Voluntary Cleanup Sites Grouped by County" list at the top of the page.
  - https://www.colorado.gov/pacific/cdphe/voluntary-cleanup
  - https://www.colorado.gov/pacific/cdphe/hm-gis-data

- **Environmental Covenants:** Environmental Covenant Sites are listed on the CDPHE HMWMD website. The county the site is located in and a map of the contaminated area are provided on this webpage.
  - https://www.colorado.gov/pacific/cdphe/hmcovenants
  - https://www.colorado.gov/pacific/cdphe/hm-gis-data

- **RCRA Corrective Action Sites:** The U.S. Environmental Protection Agency maintains a list of RCRA Hazardous Waste Corrective Action sites in Colorado that are undergoing or potentially undergoing groundwater remediation.
  - https://www.epa.gov/cleanups/cleanups-my-community
  - Visit the CDPHE's Hazardous Waste Corrective Action Unit Contacts for more information on a corrective action site.

- Brownfield Sites: The CDPHE HMWMD maintains a list of active Superfund sites on its website.
  - https://www.colorado.gov/pacific/cdphe/brownfields
  - https://www.colorado.gov/pacific/cdphe/hm-gis-data

APPENDIX C: Division Determination Using the Application Information and Data

As a general rule of thumb, the division will make an initial determination of appropriate permit coverage based largely on the proximity of your project site to known sources of contamination and the potential to draw-in the contaminated groundwater. The division will then review analytical data and information submitted with the application, along with any additional information available to the division, to determine whether your project has the potential to draw-in contaminated groundwater and to verify that you have selected the correct permit coverage for your project. Where analytical data is included with the permit application, the division will conservatively compare the maximum detected concentration of each detected constituent to one-half the applicable water quantity standard to determine if there is reasonable potential for a pollutant in the source water to exceed a water quality standard of the receiving water.

- For project sites where no known potential sources of contamination are located within one mile of the project site AND the permit applicant has no other information which would indicate that the discharge may be contaminated:
    - No source water analytical data is required with the permit application.
        - These projects will typically be permitted under *Construction Dewatering (COG070000)*
- For project sites where known potential sources of contamination **only** BTEX are located within one-half mile of the project site:
    - BTEX data is required with the application, unless the applicant can provide other information indicating there is no reasonable potential for BTEX to contribute pollutants to the source water.
        - Where the data shows that the source water does not contain concentrations of BTEX greater than ½ the water quality standards of the receiving water, the project may be permitted under *Construction Dewatering (COG070000)*.
        - Where the data show that the source water does contain concentrations of BTEX greater than ½ the water quality standards of the receiving water, the project may be permitted under *Remediation Activities Discharging to Surface Water (COG315000)* or *Remediation Activities Discharging to Groundwater (COG316000),* or an individual permit as applicable.
- For project sites where other known potential sources of contamination are located within one mile of the project site:
    - Pre-screening data (see Attachment 1 of the application) is required, unless the applicant can provide other information indicating that there is no reasonable potential for the contamination to contribute pollutants to the source water being discharged.
        - Where the data show that the source water does contain concentrations of potential pollutants from the contamination source that are greater than ½ the water quality standards of the receiving water, the project may be permitted under *Remediation Activities Discharging to Surface Water (COG315000)* or *Remediation Activities Discharging to Groundwater (COG316000),* or an individual permit as applicable.

The flowchart in this guidance summarizes the above detailed process used by the division for evaluating data and determining appropriate permit coverage. Note that other factors may be considered outside of these guidelines, resulting in the need for additional information to supplement the permit application.