



# Combined Report Instructions

(Revised 1/09/2020)

## Introduction

The Division of Oil and Public Safety (OPS) has designed the Combined Report format to be compatible with Excel 2007 (or later) versions running a 32-bit platform for the following reports.

- Site Characterization Report (SCR)
- Monitoring and Remediation Report (MRR)
- No Further Action Request (NFAR), in combination with SCR or MRR data

The report format is designed to record comprehensive site information in a cumulative fashion to allow the preparer to efficiently add site information as the project progresses; as such, data and information should not be removed from the report except for items being replaced with updated information (e.g. narratives, groundwater sample/flow maps, lab reports, etc.). The intent is that all data pertinent to NFAR review is readily available. All collected environmental and remediation data must be included in this report in the appropriate tabs, or in the Other Documentation tab. The last report submitted should be opened and modified by the preparer for the next submittal period.

Please refer to our [website](#) for report naming conventions and submittal requirements. A brief description of the information to be included and how to enter the information into the worksheets is provided below.

When the Excel file is opened, the Cover sheet will appear first.

1. Select the "Enable Macros" button, if it appears.
2. Select the title of the report you wish to prepare from the drop-down menu.
3. Enter the Facility ID, Event ID, reporting period, year and report submittal dates. The Event ID and date information entries from the Cover sheet are automatically carried through to all other worksheets.
4. Enter the SCR and original CAP submittal dates.

You may receive a "run time error" notice the first time you open the downloaded file. This is a security function of Excel. Once the template has been saved to your hard drive, the error should not appear when the file is reopened. Please contact OPS if it does.

The tabs are color-coded as follows to aid in locating grouped information.

- **Blue tabs** represent general [site and exposure information](#).
- **Green tabs** represent [environmental data tables](#).
- **Yellow tabs** represent [remediation data tables](#).
- **Orange tabs** represent [figures and diagrams](#).
- **Red tabs** represent [additional supporting information](#).

If you are submitting a semi-annual or annual report incorporating several monitoring events, each laboratory report and the pertinent maps for each event occurring within the reporting period must be included in the cumulative report.

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## Site Information

### *Narrative*

OPS requires that a narrative presenting the conceptual site model (CSM) be included in an effort to improve project understanding. The narrative must be signed by the site Recognized Environmental Professional (REP), if one is involved. Overall, the CSM narrative should summarize all existing site information, environmental data, and corrective action efforts as they lead toward exposure pathway elimination and, ultimately, site closure. A thoroughly developed CSM should identify the risks and concerns associated with the release, remedial objectives, remedial progress, and data gaps. While a specific format will not be required, OPS requires the following items to be included in the narrative.

#### Introduction

Briefly summarize contaminant release information. Identify what was released, when and how the release was discovered, ~~and~~ where the known sources are, if the release was chronic or acute, the estimated duration of the release, and if the release is potentially ongoing. Describe any repairs to the portion of the petroleum fuel system from which the release occurred.

#### Summary of Contaminants

Summarize soil contamination characteristics. Describe known and/or potential vadose zone impacts, their volumetric extents, and their associated sources. Identify vadose zone, smear zone, and bedrock lithologies and their potential effects on contaminant distribution. Identify potential impacts to receptors, if any.

Summarize groundwater contamination characteristics. Identify the contaminant extents and if the plume characteristics fit into the CSM or if additional assessment is required. Identify saturated lithology and its potential effects on contaminant distribution. Contaminant mass transport and mass storage areas should be identified (and visually depicted in the site cross-sectional diagrams) and a contaminant mass estimate should be calculated. Separate mass estimates for different potential treatment areas are appropriate.

Summarize hydrogeological and groundwater contamination characteristics. Identify the contaminant extents and whether the plume characteristics fit into the CSM or if additional assessment is required. Identify saturated lithology and its potential effects on contaminant distribution.

Identify all impacted or potentially impacted points of exposure (POEs) where receptors may be exposed to the contamination. Identify and evaluate all exposure pathways as either complete or incomplete.

Site-specific target levels must be calculated for onsite locations that exceed the Tier I risk-based screening levels.

#### Summary of Previous Remedial Actions and the Approved Corrective Action Plan

Summarize previous pilot testing and remedial actions. Explain where previous remedial actions occurred, their operational period, and the apparent reasons for their effectiveness or lack thereof. Introduce the current remedial action plan and timeframe of the approved CAP.

#### Summary of Reporting Period Monitoring and Assessment Activities

Identify which monitoring points were sampled and when, any deviations from the approved monitoring plan, and those wells/vapor points that are significantly contaminated and their contaminant trends.

Summarize assessment work completed during the reporting period. If soil sampling was conducted during the reporting period, provide the reason for the sampling along with a description of the sample locations and results.

### Summary of Reporting Period Corrective Action Activities

Summarize recent remedial activities and results. Identify if the corrective action (system) is operating as designed and discuss downtime or other obstacles toward implementation. Discuss primary and secondary trends, and if the cleanup is on schedule to achieve closure.

### Conclusion (Synthesis/Update of CSM)

Describe how site data support or don't support the CSM. Describe whether the corrective action appears to be effectively reducing the contaminant concentrations in all affected media and provide an update to the CSM. Identify if the current remedial actions are on track to meet the projected closure goals (e.g., Tier II SSTLs) and date or if additional actions need to be taken to bring the site to closure. Qualify data gaps as either significant gaps that require the collection of additional information to properly develop the CSM or minor data gaps where additional data collection will not likely result in an enhanced site understanding. Additional work should be identified to address significant data gaps the CSM does not explain.

The narrative should be inserted in the Excel worksheet as a PDF document as described in the Figures section below.

### ***Site Information***

Current and historic site information must be entered in all applicable fields. Insert Latitude/Longitude for the existing or former facility. Any inaccuracies in the Colorado Storage Tank Information System (COSTIS) database and the subject site should be reported to the assigned technical reviewer or the OPS Technical Assistance Line.

### ***Exposure Pathways and Receptors***

This tab must be completed in full. Known information should be entered in all applicable fields. It is anticipated this tab will be updated as more information is gathered.

### ***Water Well and Surface Water Data***

Enter water well and surface water data for receptors within 2,500 feet of the facility. Include monitoring wells in the area if they are pertinent to the CSM. Identify each well's location to the quarter-section and include construction details; if these are not available from the State Engineer's records, note this in the narrative. Field confirmation of location, condition, ownership and use of critical wells is recommended.

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## **Environmental Data Tables**

### ***General Table Instructions***

It is important that the existing format and/or formulas included in cells are not altered. Excel sheets with no data must not be deleted from the workbook or macros embedded in the file may no longer work properly. Further, tabs must not be renamed, added or moved.

When copying data between tabs or transferring site data from previous report formats, the following procedures must be followed.



## ***Groundwater Trends Table and Graphs***

Choose three wells within the benzene plume (one near the source, one impacted well near the leading edge and one midway between these two wells) to track benzene concentration and LNAPL thickness relationships relative to groundwater elevation. Injection events or operation of remedial systems should be noted below the trends table to allow easy correlation of remedial action to changes in well concentrations.

## ***Soil Analytical Results Table***

Analytical data from soil sampling must be entered in appropriate cells. All soil information gathered as a part of the release event (or prior events) must be included on this table and must also be represented on a figure. A separate table at the bottom allows for recording other pertinent soil data (e.g. Foc, grain size and TCLP-lead) if available.

The location of the soil sample in relation to the average groundwater table should be noted. The disposition of contaminated soil column is generally intended to reflect excavation situations. For example, if a soil sample is collected for confirmation purposes, found to be impacted and additional mass is removed, "EDO" or "TRE" may be a proper entry. If the soil represented by the sample cannot be further excavated, "LIP" is the proper entry. In all cases, soil boring samples should be labeled "LIP" since the soil mass the sample represents remains in place.

## ***Soil PAH Analytical Table***

Analytical data from soil sampling must be entered in appropriate cells as applicable.

## ***Soil Vapor Table***

Sampling measurements and analytical data for soil vapor sampling must be entered in the appropriate cells as applicable.

## ***Indoor Air Table***

Sampling measurements and analytical data from indoor/ambient air sampling must be entered in the appropriate cells as applicable. Indoor air concentrations should be compared to ambient air and the CDPHE Air Screening Concentrations Table and discussed in the CSM narrative.

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## **Remediation Tables**

### ***Remediation Target Goals***

This table is intended to record remedial goals determined from modeling, and to prompt the preparer to consider remedial progress as the project continues. At a minimum, Site Specific Target Levels must be calculated for onsite source area wells where dissolved phase impacts are identified above the Tier 1 Risk Based Screening Level (RBSL) and for soil impacts above the Tier 1 RBSL where dissolved phase impacts are less than the Tier 1 RBSL. Additional SSTLs may need to be calculated upon discussion with OPS. Complete the applicable sections of the table and update the Closure Goals question at the bottom of the worksheet. Supporting models and site-specific input data must be included in the "Model Input & Results" tab.

### ***Excavation Detail Table***

Enter excavation details. Make sure information correlates with the excavation figure and photographs.

### ***LNAPL Abatement and Total Fluid Recovery Table***

Information from LNAPL abatement and total fluid recovery (TFR) activities must be entered as applicable.

### ***SVE-AS Table and Graphs***

Insert operational data from air sparge (AS) and/or soil vapor extraction (SVE) systems in this table. SVE emissions data is automatically graphed based on the information entered in the table. Note system start and stop dates in the "Groundwater Trends Table" tab.

### ***DPE-P&T Table and Graphs***

Insert operational data from dual or multi-phase extraction processes, or pump and treat operations, into this table. Mass removal data is automatically graphed based on the information entered in the table. Note system start and stop dates in the "Groundwater Trends Table" tab.

### ***Chemical Oxidation and Bio-Enhancement Table***

Enter data as it relates to oxygen enhancement systems (e.g., oxygen injection system, ozone generation system), in-situ chemical oxidation, or bio-enhancement/nutrient applications. Field injection forms or subcontractor summary reports should be included in either the "Pilot Test Results" or "Other Documents" tab to provide more detail on the injection events. Note injection dates in the "Groundwater Trends Table" tab.

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## **Figures and Diagrams**

### ***General Figure Information***

Insert a PDF file of each figure/map in the appropriate sheet as directed on the sheet. [Label icons](#) with a descriptive caption and date.

All maps should include these five items.

- Title
- Legend
- Bar scale
- A north arrow, preferably oriented with north at the top of the page
- Date of data collection

Include these items on each site figure.

- Confirmed or suspected source release points
- Current and former tank system locations, including dispensers and piping runs
- Structures on the site and adjacent properties, with property address numbers and property boundaries shown

All applicable figures must be submitted, carried over and updated in all subsequent reports. Descriptive captions for icons are recommended. A locator map should be provided if the area of the map is not easily recognizable or is of large scale.

### ***POE Location Figure***

This figure should identify and highlight all potential points of exposure in the immediate vicinity of the site (e.g., property boundaries, surficial soils, subsurface utilities, adjacent structures, groundwater wells and surface water features/sensitive environments, if applicable). All subsurface utilities identified during public or private locates must be included.

### ***Water Well and Surface Water Figure***

This figure should be based on a 7.5-minute topographic map to locate the site in relation to its surroundings. Identify the township, range and section in the legend of the figure. All groundwater wells and surface water features within 2,500 feet of the site should be located as accurately as possible, clearly identified, and correlate to the 'Water Well and Surface Water Table'.

### ***Groundwater Sample Figure***

Include separate maps for each monitoring event. All groundwater monitoring points (current and former) must be included on this figure. Include groundwater quality data in a text box for each location. Benzene and MTBE concentrations must be contoured in different colors or line types on the figure(s) (or separate maps) to at least indicate the extent greater than RBSLs. If possible, indicate the largest historical extent of groundwater impact. Indicate wells that have LNAPL with "LNAPL" and the measured LNAPL thickness (i.e. 0.02 ft). When inorganic or field parameters are mapped, please provide these on a separate map from BTEX/MTBE/TPH data.

### ***Groundwater Elevation Figure***

Include separate maps for each monitoring event. Place groundwater elevations with corresponding wells. Illustrate the water table by contouring the most recent groundwater elevations. The groundwater flow directions must be indicated by arrows.

### ***Soil Sample Figure***

All soil sample locations and the release location(s) must be included on this figure. If more than one soil figure is provided, make sure the relationship between figures is apparent. A text box with date, sample depth and laboratory analytical results should be included with each location.

### ***Excavation Detail Figure***

Insert an excavation figure detailing the horizontal and vertical (floor depth) extents of all contaminant mass removal excavation activities. Include soil sample locations. Excavation photos with captions/dates should be inserted as PDFs in the 'Photographs' tab.

### ***Cross Section Diagrams***

Cross-sections are a key component of the CSM for the site. At a minimum, cross sectional diagrams along the major and minor axis of the contaminant bearing area must be included. Include a map that shows the x-section locations. These diagrams must include the following items.

- Subsurface lithology (inferred between points)
- All wells and soil borings as appropriate along the transect
- Excavated zones and backfill type
- High/low seasonal groundwater range (from historical well data)
- PID readings (from drilling logs or excavation activities) and soil sample results
- Estimated (shaded) zones of contamination based on visual observation, PID readings or laboratory analysis
- Pertinent surface features (structures, surface cover, etc.)
- Subsurface utilities
- Vertical and horizontal bar scales

Fence diagrams and maps of sediment thickness or bedrock surface topography may also be useful and should be included here, if developed.

### ***Soil Vapor Sample Figure***

Include the most recent soil vapor and/or indoor air sample data. A text box with date, sample depth and laboratory analytical results should be included with each location. Structures on the site and adjacent properties should indicate the property address numbers and property boundaries. Identify structures within the potential lateral inclusion zone as well as buffer zone to account for uncertainty. Buildings should be identified as residential, business-occupied or industrial and indicate if the structure has a crawl space (CS), basement (B), or slab on grade (SG).

### ***Remediation Figures***

Figures that depict as-built mechanical systems, in-situ treatment applications, and pilot test applications must be inserted here. Examples are listed below.

- Injection point locations and treatment area for in-situ treatment applications
- System/trench/well layout in relation to the site and impacted areas
- Trench and piping cross-sections
- Equipment positioning in the shed or outside (equipment layout)
- Process and instrumentation diagrams (P&ID) to illustrate how the system works (process flow) and monitoring equipment / sampling locations
- Photographs of the remedial system during and after installation go in the 'Photographs' tab.

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## **Additional Supporting Documentation**

### ***Laboratory Reports***

Provide a PDF file of the laboratory report with a chain-of-custody form for all soil, soil vapor, and groundwater samples analyzed during the reporting period.

### ***Boring (and Well) Logs***

Include all boring and well construction logs related to the release event. Include all boring logs gathered as part of the CSM and other relevant boring logs, if appropriate. Boring logs must include:

- the site name and address,
- boring number,
- date completed,
- surface elevation,
- depth,
- borehole diameter,
- initial and static water levels (if available),
- a geologic description and/or Unified Soil Classification System (USCS) class of each rock or soil type encountered including any staining or petroleum odors.
- drilling method,
- sampling method,
- lithologic graphic to scale,
- an indication of the intervals from which samples were collected,
- results of soil screening, and

The following information should be included with the lithologic logs if a well has been completed:

- total depth of the well,
- casing elevation,
- diameter of the well casing,
- well casing material,
- length and depth of the screed interval,
- size and type of screen,
- type of filter pack material,
- type of annular seal,
- type of surface seal,
- type of well casing cap,
- method of securing the well casing cap, and
- the type of protective surface casing.



Include a scaled well completion graphic that indicates the depth to the top of the filter pack, the depth to the top of the annular seal, and the location of the screened interval. Refer to OPS Petroleum Guidance for a sample log. Include PDF copies of Notices of Intent and well permits filed with the State Engineer's office.

### ***Photographs***

This tab is for any other photographs of excavation activities, remedial systems and installation activities, site conditions (structures, access limitations, topography, etc.) or other pertinent features that impact site work or may be of interest during technical review by OPS.

### ***Model Input and Results***

Insert PDF copies of the following items.

- Fate and transport modeling input parameters
- Fate and transport modeling results, including the graphical output
- MNA tool calculations
- Slug test (rising head) field data
- Interpretative graphs of slug test data (recovery curves)

### ***Pilot Test Results***

Insert PDF copies of pilot test field sheets and resultant design graphs/calculations here. Maps should be inserted into the "Remediation Figures" tab.

### ***Other Supporting Documentation***

Provide additional documentation/supplemental information in PDF, Word or Excel format, such as:

- copies of field notes,
- access agreements/requests,
- receptor well details from the State Engineer's office,
- permit applications/approvals,
- manifests,
- historic summarized groundwater data tables,
- additional tables and graphs,
- historical photographs or aerial photographs,
- Sanborn Fire Insurance Maps,
- subcontractor reports/data sheets, and
- TFR field sheets.

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