Detterman, Karel, Env. Health

From: Sanders, Jonathan, Env. Health
Sent: Wednesday, August 8, 2018 1:51 PM
To: Skov, Erik
Cc: Detterman, Karel, Env. Health; Roe, Dilan, Env. Health
Subject: RE: Site Cleanup Program (SCP) Case No. RO0003268 - Nash Holland Development - Basis for Remedy Design
Attachments: RO3268_BOD_CL_2018-08-07.pdf

Follow Up Flag: Follow up
Flag Status: Flagged

Erik,

Alameda County Department of Environmental Health (ACDEH) has completed the review of the *Basis for Site Remedy Design* dated March 27, 2018 and prepared by AECOM (the "BOD"). Please find attached a completed copy of ACDEH's review checklist. This review checklist identifies elements of the BOD that ACDEH has determined are incomplete or unacceptable and that will need to be addressed with technical comment. ACDEH requests that a revised BOD that addresses the incomplete or unacceptable elements identified in the review checklist be submitted to ACDEH and uploaded to the GeoTracker case file by a compliance date of October 8, 2018.

In addition to the incomplete or unacceptable elements identified in the review checklist, ACDEH has the following additional technical comments that need to be addressed in the revised BOD:

- **Termination detail for EPRO System** – A termination detail for the EPRO system was not provided in the BOD.
- **Controlled Density Fill (CDF) Specifications and Quality Control & Quality Assurance (QA/QC) -** Specifications and QA/QC measures for CDF were not provided. Specifications must include acceptable tolerances for CDF mixture ratios. QA/QC measures must include acceptance criteria and testing requirements.
- **Trench plug surveying –** ACDEH requires that the location of all trench plugs be surveyed and that these surveyed locations be included in the Record Report of Construction.
- **Garage Ventilation** – The BOD discusses the role of the garage ventilation system as a passive/active ventilation system for the protection of the on-site commercial and residential units, however, design elements of the garage ventilation system (e.g., design minimum, nominal, and maximum air exchange rates; Influents and effluents; ambient air/recycled air feed ratio; redundancies; operational parameters/schedule) are not included. ACDEH notes that the garage and associated ventilation system is identified as an engineering control for the otherwise complete vapor intrusion pathway and during a phone conversation with the design firm (AECOM) were provided as technical justification for why sub-grade venting was not necessary. As such, the design elements of the garage ventilation system and engineering calculations for the effective minimum, nominal, and maximum dilution factor for air within the garage must be included in the BOD.
- **Repair Sequencing** – Repair sequencing for both barrier systems was omitted from the BOD.
- **Operations and Maintenance** – Annual operations and maintenance reporting must also include and inspection of the garage ventilation system and identification of any failures or maintenance activities conducted by others.

If you have any questions, please do not hesitate to contact me via email or phone. Thank you.

Jonathan E. Sanders
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Alameda County Department of Environmental Health

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From: Sanders, Jonathan, Env. Health
Sent: August 7, 2018 11:03 AM
To: 'Skov, Erik' <erik.skov@aecom.com>
Cc: Detterman, Karel, Env. Health <Karel.Detterman@acgov.org>; Roe, Dilan, Env. Health <Dilan.Roe@acgov.org>
Subject: Site Cleanup Program (SCP) Case No. RO0003268 - Nash Holland Development - Basis for Remedy Design

Erik,

I left you a voicemail today, but I wanted to follow up with an email. I have completed my review of the Basis for Site Remedy Design dated March 27, 2018 for the above referenced property and I would like to schedule a conference call to discuss some of the technical aspects of the design before issuing a directive letter. Would you be available for a conference call at 13:00 today?

Jonathan E. Sanders
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Basis of Design Checklist for Vapor Intrusion Mitigation Systems – Working Draft

This checklist provides Alameda County Department of Environmental Health's (ACDEH's) minimum requisite elements that must be included in a Basis on Design (BOD) report for vapor intrusion mitigation systems (VIMS). The Basis of Design (BOD) documents the reasoning and decisions made during the design phase of a project. The BOD should present the assumptions, considerations, design criteria, basic rational and logic, and engineering calculations that serve as the basis for the design of engineering controls. The BOD is (or is an element of) an engineering document and not a construction document. The BOD must be submitted concurrent with a construction plan set and specifications, however, the BOD is independent of these documents. The following checklist is a summary of minimum standards for submittals of BOD to ACDEH and mirrors the contents and organization that ACDEH recommends for a BOD. This checklist is not intended to provide minimum requirements for construction plan sets or specifications for vapor intrusion mitigation systems.

Index	Major and Minor Element	Included	Compliant
1.0	**General**		
1.1	Perjury Statement – *A cover letter from the Project Owner that states, at a minimum, the following: "I have read and acknowledge the content, recommendations and/or conclusions contained in the attached document or report submitted on my behalf to the State Water Board's GeoTracker website". This cover letter must be signed by the Project Owner or a legally authorized representative of the Project Owner.*	No	No
1.2	Design Engineer Signature, Stamp, and Statement – *A statement that the design was prepared under the responsible charge of a registered professional engineer with licensure in the state of California. This statement must be accompanied by the seal and signature of the identified professional engineer with responsible charge.*	No	No
1.3	Party Identification – *Identification of the Project Owner, Design Engineer, and other registered professionals who have generated plans or specifications for the project which are relevant to the development of the design including architectural, structural, electrical, mechanical, and civil plan sets.* This information can all go on the "Identification form"	yes	No
2.0	**Primary Design Assumptions** *This section should identify assumptions which drive the need for engineering controls or remedial systems. This section does not need to provide technical justification for the assumptions, but should reference other documents in which technical justification for the assumptions is supported such as the Site Conceptual Model and Corrective Action Plan.*		
2.1	**Project Background**		
2.1.1	Site Development – *Figures and narrative text identifying existing development and/or proposed site development (including utilities) and land use/occupancy type. This element need not include a full plan set, but should include pertinent information to depict the location and/or construction of existing and/or proposed improvements. Full plans must be provided under a separate cover as part of the construction plan set.*	yes	yes
2.1.2	Environmental Conditions – *Tables and Figures identifying the type(s), distribution(s), and magnitude of contaminants present in environmental media (soil, groundwater, and soil vapor). This element must reference existing documents (such as a Conceptual Site Model) that provide detailed technical justification of the extents and magnitude of contamination in impacted environmental media.*	yes	yes
2.1.3	Exposure Pathways – *Identification of exposure pathways for contaminants that, in the absence of engineering controls, are complete or potentially complete for the existing or proposed Site Development.*	yes	yes

Index	Major and Minor Element	Included	Compliant
2.2	**Design Intent**		
2.2.1	Objective – Declarations of *absolute (qualitative) and functional (quantitative) objective(s), including corrective action objectives. Objectives must be provided for each of the exposure pathways identified that is proposed to be closed through implementation of engineering control measures. Functional objectives must be clear quantitative objectives which can be evaluated to determine if the objective has been achieved.*	Yes	No
2.2.2	Regulatory Agency Requirements – *Identification of ACDEH, the local building authority, and the Bay Area Air Quality Management District (BAAQMD) as oversight agencies as appropriate. This element must include identification of permitting, submittal, and review requirements for each of these agencies as they relate to the design and construction of the engineering controls to be considered complete.*	yes	No
2.2.3	Codes and Standards – *Identification and citation of applicable codes, standards, guidelines, or other references that guide the design of the engineering control system.*	No	No
2.2.4	Project Owner Mandated Requirements – *Identification of any additional requirements mandated by the Project Owner.*	No	N/A
3.0	**Design Parameters** *Design parameters consist of maximum and minimum quantitative values, Boolean (true/false) qualitative statements, and materials selection and restriction criteria.*		
3.1	Stormwater Management – *Restrictions due to* the proximity of *stormwater management systems. This element must include an evaluation of potential effects of vapor accumulation in infiltration basins as it relates to lateral migration and stormwater treatment efficacy and the effects of stormwater infiltration on depth to groundwater.*	No	N/A
3.2	Hydrological Considerations – *The historic minimum depth to groundwater and saturation effects on the design. This element must include an evaluation of the need for subgrade drainage, conveyance piping sloping, and a determination if foundation elements are located within saturated or seasonally saturated zones.*	No	No
3.3	Geotechnical Requirements – *Restrictions for conveyance course and base material (e.g., sand and gravel) due to minimum Geotechnical requirements.*	No	N/A
3.4	Building and Improvements Design – *Structural and/or foundation elements on which the design is developed. The square footage of the building footprint(s) at the ground level and any hardscaped areas around the building should be identified. At a minimum, the applicable building plan sheet numbers and detail numbers which will be incorporated into the design should be tabulated and included.*	yes	No
3.5	Construction Sequencing – *Applicable and relevant construction sequencing must be identified as it relates to the development and construction of the engineering controls. Sequencing of foundation work that will result in cold joints or post curing modifications to foundation elements must be identified or declared as absent.*	yes	yes
3.6	Building, Fire, and Seismic Code Parameters – *Quantitative and qualitative design parameters derived from codes. Examples include criteria for piping materials, securing of vertical risers, and setback distances.*	No	No

Index	Major and Minor Element	Included	Compliant
3.7	Regulatory Guidance and Policies – *Quantitative and qualitative design parameters such as minimum setbacks, overlaps distances, and minimum vent spacing derived from regulatory guidance documents and policies.*	No	No
3.8	Manufacture Specifications – *Design parameters derived from manufacturer recommendations (e.g., overlap distances, installation sequencing, minimum application thickness)*	No	No
3.9	Materials Availability and Suitability – *The commercial availability of Vapor Mitigation Systems components and chemical compatibility of these components.*	No	N/A
3.10	Constructability – *Constructability of design elements.*	yes	yes
3.11	Vapor Accumulation and Hardscape Ventilation – *Vapor accumulation beneath hardscape such as parking lots. The maximum hardscape ventilator separation distance should be identified (e.g. maximum vapor capture zone for each hardscape ventilator).*	No	N/A
3.12	Vapor Migration Pathways – *Post construction vertical and horizontal vapor migration pathways. This includes identifying the alignment and depths of wet and dry utilities.*	yes	yes
3.13	Post-construction Access for Sampling and Monitoring –*Elements to allow for post-construction performance monitoring and sample collection. This element must include access for inspections and sample collections and security measures to prevent inadvertent discharges from these access points to indoor air.*	No	(1)
3.14	Contingency for Conversion to Active System – *Elements to allow for future conversion of the passive system to an active system if necessary.* Contingency Measures may include increasing AER for garage.	No	No
3.15	Occupant Burdens and Hindrances – *Design elements that minimize the burden on occupants caused by operations, maintenance, and inspection of the system.*	No	N/A
3.16	Minimum Design Lifecycle – *The minimum design lifecycle. This lifecycle should be based on either (a) the building lifecycle or (b) the estimated time period that engineering controls will be required.*	No	No
3.17	Ambient Air Parameters – *The maximum and minimum air pressure, wind speed, and temperature for ambient air at the top of the building. Air pressure and temperature should also be identified for the subgrade where the vent collectors will be installed or at the ground level as an approximation.*	No	N/A
3.18	Building Air Parameters – *The operational pressure and temperature of air within the interior structure(s).*	yes	N/A
3.19	Vapor Vent Riser Sizing and Quantity – *Criteria for sizing vent riser piping, determining the minimum number of vent risers required, and determining the maximum length of collector piping that can be captured for a vent riser (aka the maximum service length).*	No	N/A
3.20	Vapor Collector Sizing and Spacing – *Criteria for sizing and determining the maximum spacing for vapor collectors*	No	N/A

(1) Qualitative objectives are undefined and Nothing has been proposed for the long term performance monitoring of the eng. controls. As such, it is unclear how post construction monitoring will be conducted (if at all)

Index	Major and Minor Element	Included	Compliant
4.0	**Design Solutions** *Elements of the design solution which, as a whole, are sufficient to meet the Design Intent and satisfy Design Parameters.*		
4.1	Base Material – *Identification of Vapor permeable base material.*	No	N/A
4.2	Drainage/dewatering System – *Identification of a drainage/dewatering system.*	No	N/A
4.3	Vapor Collectors – *Identification of Vapor collector.*	No	N/A
4.4	Vapor Conveyance Piping and Vent Risers – *Identification of Vapor Conveyance Piping and Vent Risers. This element must sufficient detail to evaluate flow characteristics. If subgrade conveyance piping is different than above grade risers and conveyance piping, separate specifications should be provided for each.*	No	N/A
4.5	Vapor Conveyance Piping and Vent Riser Encapsulation – *Encapsulating materials and methods for vapor conveyances piping and vent risers. This should include elements such as encapsulation of risers within walls, wraps applied to risers or conveyance piping for corrosion protection, and sleeves for conveyance piping that penetrates foundation footings.*	No	N/A
4.6	Notification and Labels – *Identification of plaques, stamps, or other labels. This identification must include sizing, the text of the notification and labels, display method and location, and method of adhesion or distribution.*	No	N/A
4.7	Rain Guard – *Identification of Vapor vent riser termination end-caps.*	No	N/A
4.8	Ventilators – *Identification of Mechanical or passive ventilators. This identification must include a reference to specifications sufficient to calculate flow rate.*	No	N/A
4.9	Hardscape Ventilation – *Identification of Vapor ventilation methods such as permeable pavers or vapor sumps with vents for hardscaped areas.*	No	N/A
4.10	Vapor Barrier System – *Identification of a vapor barrier system. This identification should include identification of bonding agents/methods and individual components of composite systems (e.g., substrate and spray applied).*	yes	yes
4.11	Vapor Barrier Protective Measures – *Protective measures for the vapor barrier, such as protective sand layers, geotextile fabric, and/or identification acceptable work practices and rebar placement practices.*	No	No
4.12	Sub-Barrier Vapor Probes – *Sub-barrier vapor probes with a minimum of one in each vent riser's service area/ vapor capture zone.*	No	No
4.13	Sentry Vapor Probes – *Sentry soil vapor probes outside the building envelope to evaluate potential lateral migration of soil vapor.* In the Absence of vents, there is an obligation to demonstrate that vapor impacts to Adj. Properties are not increased.	No	No
4.14	Trench Damns – *Trench damns with sufficient detail to evaluate compliance with design parameters.*	yes	yes
4.15	Wet Utility Sealant – *Sealants for wet utility lines with sufficient detail to evaluate compliance with design parameters.*	No	N/A
4.16	Dry Utility Plugs – *Dry utility plugs with sufficient detail to evaluate compliance with design parameters. This identification must include identification of materials and methods for installation of the plugs.*	No	N/A

Index	Major and Minor Element	Included	Compliant
5.0 (2)	**Engineering Calculations** *Engineering calculations used to support the validity of the design*		
5.1	Design Drainage/Dewatering Calculations – *Calculations to support that the drainage system is adequate.*	No	N/A
5.2	Design number of risers – *The total number of risers is identified.*	No	N/A
5.3	Design Maximum Service Length for Vapor Collectors – *Calculation of the maximum length of vapor collectors serviced by a vapor vent.*	No	N/A
5.4	Design Maximum Collector Spacing – *Calculation of the maximum collector spacing distance.*	No	N/A
5.5	Design Number of Hardscape Ventilators – *Calculation of the total number of hardscape ventilators and maximum capture zone distance.*	No	N/A
5.6	Design Wind Effects – *Calculation of the anticipated maximum, and average head due to wind effects for each vent riser.*	No	N/A
5.7	Design Stack Effects – *Calculation of the anticipated maximum, average, and minimum head due to stack effects for each vent riser.*	No	N/A
5.8	Ventilator Head – *Calculation of the anticipated maximum, average, and minimum head due to mechanical and/or passive ventilators.*	No	N/A
5.9	Piping Head Loss – *Calculation of the anticipated maximum, average, and minimum head losses along conveyance piping and vertical risers for each riser.*	No	N/A
5.10	Design Emissions Rate – *Calculation of the maximum, minimum, and average design flow rates based on wind effects, stack effects, ventilators, and piping head loss.*	No	N/A
6.0	**Construction Quality Control / Quality Assurance** *Measures for ensuring that the constructed design meets the design objective(s)*		
6.1	Material Quality Control and Quality Assurance – *Measures for ensuring that materials are free from defect prior to installation.*	No	No
6.2	Material Storage – *Materials storage criteria and requirements.*	No	No
6.4	Installer Qualifications – *Minimum qualifications for installers.*	No	No
6.5	Inspections – *Minimum required inspections and triggers for additional inspections.*	No	No
6.6	Inspector Qualifications – *Minimum qualifications for inspectors.*	No	No
6.7	Materials and Installation Testing – *Requirements for testing installed system components (e.g. seam tensile test, coupon test, wet mil test, smoke test) and triggers for additional testing requirements.*	No	No
6.8	Performance Testing – *Requirements and for evaluating the performance of the engineering control system(s) against the design objective(s).*	No	No
6.9	Reporting – *Reporting requirements and submittals to document the installation of the engineering control systems and results of the implementation of construction quality control and quality assurance measures.*	No	No

(2) In the absence of vapor collection/venting system, the following calculations are required: (a) design equilibrium sub-slab vapor concentration
(b) design barrier saturation (in years)