

MORASH, MELANIE

From: MORASH, MELANIE
Sent: Wednesday, December 16, 2015 10:07 AM
To: J. Wesley Hawthorne
Cc: Connell, Rebecca; Parker, Heather; Elizabeth Brown; Heather O'Cleirigh; Joseph Innamorati; Linda Niemeyer; Michele Yuen; Morgan Gilhuly; Nancy-Jeanne LeFevre; Peter Bennett; Peter Scaramella; Rebecca Mora; Shau Luen Barker; Shaun Moore; Soetebier, Kristen; Todd Maiden; Wendy Feng; Cynthia Woo; Lawrence McGuire; Leslie Lundgren; Rafael Rangell; Rose Condit; Wenqian Dou; DIAZ, ALEJANDRO; Estrada, Thelma; Harris-Bishop, Rusty; Lyons, John; Maldonado, Lewis; Plate, Mathew; Shaffer, Caleb; Stralka, Daniel; Yogi, David
Subject: EPA's Additional Comments - Mitigation Plans - Residences #21, 84/85, 105/124/125 - Please submit revised plans responsive to comments by Monday, Dec. 21st
Attachments: Sample Form for O_M Inspection.xlsx

Good afternoon, Wes,

Thank you for submitting revised mitigation plans and the response-to-comments letter for the three residences referenced above.

The following are EPA's additional comments on these plans.

Please revise and resubmit these plans to EPA based on these comments by Monday, Dec. 21st. We can also discuss these comments further during our weekly technical call on Thursday.

General Comments

1. The underlying cause of the vapor intrusion into these residences is the subsurface trichloroethene (TCE) contamination in the Duane/San Miguel Avenue neighborhood, for which EPA has identified Philips Semiconductors, Northrup Grumman Systems Corporation, and Advanced Micro Devices as the Responsible Parties (RPs). Therefore, the vapor intrusion mitigation plans for these residences should not in any way infringe on the use of these crawlspaces by the occupants (e.g., reduced or impaired use of any spaces, including height reductions) nor cause for any uncompensated costs (e.g., for operation or maintenance of the mitigation systems). Electricity usage in the hundreds of dollars per year may be a significant and burdensome cost for families in lower income brackets or on fixed incomes, for example. The mitigation plans must be revised accordingly.
2. An addendum to the project Health and Safety Plan (HASP) should be prepared to incorporate EPA's accelerated and urgent response action levels of 7 and 21 micrograms per cubic meter (ug/m³) of air for TCE, respectively. Specification should be included for the following:
 - Air monitoring procedures for TCE
 - EPA's accelerated and urgent response action levels for TCE
 - Response actions to be taken if TCE trigger levels are exceeded

The HASP should specify what types of activities will prompt personal TCE monitoring and should include personal TCE air monitoring, as appropriate, of all workers entering a crawlspace work area, excavation, trench, or pit. Respiratory

protection requirements and/or engineering controls should be discussed. For example, measures may include ventilation of the crawlspace work area and air monitoring to verify that TCE levels are acceptable, prior to worker entry without respiratory protection.

If either the Accelerated or Urgent Response Action Levels (7 and 21 ug/m³, respectively) have been exceeded during response activities, EPA should be notified within **24 hours** of receipt of preliminary analytical results.

Specific Comments

1. Sub-Membrane Depression System Piping

Page 2: *“Trenching of perforated pipe will be implemented if the mitigation installer deems it necessary or if the resultant height from the top of perforated pipe to the bottom of untreated wood or ductwork is less than 18 inches.”*

As discussed above under “General Comments,” the installation of these mitigation systems should not infringe on the use of the crawlspaces by the occupants (e.g., reduced or impaired use of any spaces, such as height reductions in crawlspace areas). The mitigation plans must be revised to include installation of piping level with the existing grade. This means installing the perforated piping in a trench that is filled with gravel level with the ground.

This can be done by digging 6-inch-by-6-inch trenches in the crawlspace soil and laying the 4-inch perforated pipe into the trench with one row of perforations facing up and then backfilling the trench with gravel to be level with the crawlspace ground. As a result, access to the crawlspace will not be impaired, as it otherwise would be due to reduced clearance below the sub-floor resulting from pipes laid on top of the ground.

Regarding the plan for the perforated piping, 4-inch diameter perforated pipe is recommended, with a minimum of one pipe laid midway along the length and one pipe laid midway along the width, intersecting at the center of the crawlspace, with a T-connection. With the exception of the pipe connecting to the suction fan, the ends of each of the perforated pipes should be capped.

2. Vapor Barrier

Page 2: *“The proposed vapor barrier is a Dura-Skrim 12WB by Raven Engineered Films, which meets or exceeds the ASTM E-1745 Class C standard.”*

The proposed membrane, Dura-Skrim 12WB, is an ASTM E-1745 Class C Membrane, the lowest grade membrane specified by ASTM E-06, “Performance of Building Constructions.”

The manufacturer’s data sheet (attached in the proposed revised mitigation plans for the three residences) states that this membrane is for “temporary applications” and not long-term applications, as may be required.

The following statement in the mitigation plans appears to be the rationale for selecting this low-grade membrane: *“The crawlspaces of the three subject residences are not used for storage nor entail frequent entry.”*

However, the assumption that the crawlspaces will “not be used for storage nor entail frequent entry” is not a reliable assumption nor one that may be ensured in the long-term, as some people do use crawlspaces for storage, or may use them for storage at some point in the future, regardless of their current status. Home renovation or repair activities may also take place in the future and result in short-term or more frequent and lengthy entries into the

crawlspace. Thus, a more durable 20-mil membrane that meets or exceeds the performance of an ASTM E-1745 Class C Membrane is appropriate.

The same manufacturer as the membrane proposed in the mitigation plans, Raven Engineered Films, makes such a product, Vaporblock Plus VPB20, that is specifically designed for long-term mitigation of ground contaminants. See the following specification sheet: <http://ravenefd.com/products/vaporblock-plus/>

3. Suction Fan

Page 3: *“There are not expected to be any substantial costs to the owner for the implementation of this mitigation plan.”*

EPA does not agree with this statement. We estimate the cost of operating the suction fan to be up to \$250 per year at current residential electric power costs. These costs may be substantial and burdensome to some families, for example, those at lower income levels or on fixed incomes. The mitigation plans should be revised to include the estimated costs of operating the fan. These costs may be calculated based upon measurements of the actual power (watts) used by the installed fan(s) and the estimated annual cost of operation, assuming continuous operation (as is required), and utilizing the estimated annual power costs (cost per kilowatt-hour). This calculated annual cost must be reimbursed to the owner/occupant in advance of each year of operation, or at some other frequency acceptable to the owner/occupant.

4. Alarm

“The alarm will be installed on the exterior of the building, readily visible, capable of being silenced, and will consist of both an audible alarm and a flashing light.”

The fan operation alarm should be installed in an accessible location inside of the home that is acceptable to the occupant, not outdoors as is proposed. An audible alarm sounding from an outdoor location may disturb neighbors (and also draw unwanted attention to the system’s presence in the home), for example, in the event that the owner/occupant is away (at work, on vacation, etc.).

The alarm should consist of both an audible alarm and a visible warning light that is activated when the suction pressure at a location upstream of the fan falls below 0.25 inches of water. The fan operation audible alarm needs to have the capability of being silenced so that the occupants are not disturbed while waiting for a Locus technician to respond and make repairs. The audible alarm should be able to be silenced, while the flashing light should remain flashing until the system is fixed. In addition, there should be a visible warning of loss of power to the alarm.

The fan alarm proposed by Locus in the revised mitigation plans (see page 4 of the December 4, 2015, revised mitigation plan for Residence #21) is as follows: *“Checkpoint IIa by Radon Away, or similar, including audible and visual alarm and silencing capability. Alarm will sound (and light flash) when vacuum is below 0.5” WC.”*

This fan is unacceptable. Firstly, this fan is factory pre-set for 0.25 inches of water, not 0.5 inches of water as stated. Secondly, the audible alarm cannot be silenced without having to disconnect the power to the alarm.

The mitigation plans should be revised to incorporate an alternate fan that meets the requirements discussed above. See, as an example, the Tjerlund Fan Failure Alarm Model RA1A: <http://shop.tjernlund.com/collections/radon-mitigation-fans-and-alarms/products/ra1-fan-failure-alarm>

Regarding these types of fan alarms, when the fan is operating and creating a suction pressure greater than 0.25 inches of water, the green light is on. When the fan is operating and creating a suction pressure less than 0.25 inches of water, the green light turns off and a red light comes on and an audible alarm is activated. If the power to the alarm is interrupted, both the red or green lights are off.

In order to silence the audible alarm during a system failure while maintaining the visible red light, a single pole-single throw switch is installed on the front of the alarm box. This switch is installed such that the power to the audible alarm is turned off when the switch is toggled off. The manufacturer states that the alarm box has ample area to install this switch on the face of the box. The two positions of this switch are then labeled “Audible Alarm ON” and “Audible Alarm OFF.” This is an inexpensive modification to this alarm that can be made by the installation contractor. The alarm then provides an audible alarm when there is a fan suction failure that can be easily silenced, while maintaining the red warning light as a reminder that the system has failed and needs repair.

Signage for the fan alarm should include the following, or its equivalent:

UNDERGROUND CONTAMINATION REDUCTION SYSTEM / VAPOR INTRUSION MITIGATION SYSTEM

Green Light—System Operational.

Red Light—System Failure—immediately call Locus Technologies (phone number) and report the failure with your name, address and phone number.

No Lights—Alarm Power Failure—immediately call Locus Technologies (phone number) and report the failure with your name, address and phone number.

NOTE: The audible alarm can be silenced by switching the audible alarm switch to the “Audible Alarm OFF” position. Immediately notify Locus Technologies (phone number) and report the failure with your name, address and phone number.

5. Remote Monitoring

The plans state that remote monitoring will be conducted, if this technology is available. This technology is available and should be incorporated into all of the system designs. These systems should be engineered to remotely communicate with Locus offices to provide automatic notification in the event of a system failure. We cannot place responsibility on the various owners/occupants to notify Locus in the event of a system malfunction, nor do we have any method of guaranteeing that any given owner/occupant will promptly report a system malfunction for the entire time that the system is needed. Also, given the number of mitigation systems that will be installed in the neighborhood, a centralized system of remote monitoring of which we have control, is appropriate.

6. Operation, Monitoring & Maintenance (OMM) Plans

We have attached a suggested operation and maintenance (O&M) field sheet, which should be incorporated into the OMM plans for each residence. All of the data collected in this field sheet (or its equivalent) during the periodic OMM inspections should be entered into a secure database for each residence. This data will be helpful in assessing the performance of the systems over time as well as ascertaining the frequency of failures across all of the buildings with these mitigation systems.

The OMM plans should also include provisions for long-term indoor and outdoor air monitoring. Outdoor air monitoring approaches should include a framework for evaluating and responding to localized increases in outdoor air TCE levels that may result from the emissions of multiple active depressurization systems.

Please plan to develop and provide OMM plans for each residence to EPA for review and comment as soon as possible following system installation. A schedule for submitting these plans to EPA should be developed and provided to EPA within ten (10) calendar days of receipt of EPA's approval of these residential mitigation plans. OMM plans should also include a schedule of deliverables that will be provided to EPA (inspection field sheets, monitoring reports, failure analyses & plans to prevent reoccurrence, etc.) on a periodic basis.

7. Post-Mitigation Sampling Plan

It can be acceptable to reference the EPA-approved Quality Assurance Project Plan (QAPP) for the project in development of the final OMM plan, however, the QAPP does not cover all of the types of quality assurance/quality control (QA/QC) procedures for the post-mitigation OMM. An addendum to the QAPP (or its equivalent) should be prepared as part of the OMM plan, which should cover all of the types of sampling and inspection that will be required as part of long-term OMM of these vapor intrusion mitigation systems.

8. Sampling Ports

Page 6: *"The revised mitigation plans clarify that a sample port will be installed on the vapor stack above (downstream of) the suction fan. Below (upstream of) the fan a second port will allow for pressure and flow measurements."*

A sample port should be installed immediately upstream of the suction fan, not downstream, to eliminate any dilution of the exhaust air by air leakage through the fan enclosure. A gas-tight sample port should also be installed immediately upstream of the suction fan for measurements of the TCE concentration being removed from under the membrane.

For measuring the fan performance, pressure ports should be installed immediately upstream and downstream of the suction fan to allow O&M measurements of both the suction pressure and fan differential air pressure as well as to provide a port for the fan alarm suction-pressure connection.

The fan alarm air pressure set point proposed in the revised mitigation plans (see page 4 of the December 4, 2015, revised mitigation plan for Residence #21) is as follows: *"Checkpoint IIa by Radon Away, or similar, including audible and visual alarm and silencing capability. Alarm will sound (and light flash) when vacuum is below 0.5" WC."*

This fan is factory pre-set for 0.25 inches of water, not 0.5 inches of water as stated.

9. Backdraft of Combustion Appliances

Please revise the mitigation plans to include installation of a new carbon monoxide detector in each residence following completion of installation activities.

10. Mitigation Termination

The proposed Mitigation Termination Plan should be developed and submitted to EPA for review and comment as soon as possible following system installation. The Mitigation Termination Plan should consider the concentrations of TCE in the groundwater as well as the concentrations of TCE in the air under the crawlspace membranes, the crawlspaces,

indoor locations including attached garages and enclosed patios of all homes collectively with mitigation system installations, and outdoor background locations.

Please plan to develop and provide a Mitigation Termination Plan to EPA for review and comment as soon as possible following system installation. A schedule for submitting this plan to EPA should be developed and provided to EPA within ten (10) calendar days of receipt of EPA's approval of these residential mitigation plans.

Regards,

Melanie

Melanie Morash, Project Manager
California Site Cleanup Section I, Superfund Division

US EPA Region 9
75 Hawthorne Street (SFD-7-1)
San Francisco, CA 94105

(415) 972-3050 [phone]
morash.melanie@epa.gov

From: J. Wesley Hawthorne [<mailto:hawthornej@locustec.com>]
Sent: Friday, December 04, 2015 4:56 PM
To: MORASH, MELANIE <morash.melanie@epa.gov>
Cc: Connell, Rebecca <Connell.Rebecca@epa.gov>; Parker, Heather <Parker.Heather@epa.gov>; Elizabeth Brown <elizabeth.c.brown@ngc.com>; Heather O'Cleirigh <heather.ocleirigh@amd.com>; Joseph Innamorati <joseph.innamorati@philips.com>; Linda Niemeyer <linda.niemeyer@ngc.com>; Michele Yuen <myuen@reedsmith.com>; Morgan Gilhuly <rmg@bcltlaw.com>; Nancy-Jeanne LeFevre <LeFevren@locustec.com>; Peter Bennett <pbennett@haleyaldrich.com>; Peter Scaramella <pscaramella@haleyaldrich.com>; Rebecca Mora <rebecca.mora@aecom.com>; Shau Luen Barker <shauluen.barker@philips.com>; Shaun Moore <shaun.moore@amd.com>; Soetebier, Kristen <KSoetebier@ReedSmith.com>; Todd Maiden <tmaiden@reedsmith.com>; Wendy Feng <wfeng@cov.com>; Cynthia Woo <cynthia.woo@cbifederaleservices.com>; Lawrence McGuire <l.mcguire@circlepoint.com>; Leslie Lundgren <leslie.lundgren@cbifederaleservices.com>; Rafael Rangell <r.rangell@circlepoint.com>; Rose Condit <rose.condit@cbifederaleservices.com>; Wenqian Dou <wenqian.dou@cbifederaleservices.com>; DIAZ, ALEJANDRO <Diaz.Alejandro@epa.gov>; Estrada, Thelma <Estrada.Thelma@epa.gov>; Harris-Bishop, Rusty <Harris-Bishop.Rusty@epa.gov>; Lyons, John <Lyons.John@epa.gov>; Maldonado, Lewis <Maldonado.Lewis@epa.gov>; Plate, Mathew <Plate.Mathew@epa.gov>; Shaffer, Caleb <Shaffer.Caleb@epa.gov>; Stralka, Daniel <Stralka.Daniel@epa.gov>; Yogi, David <Yogi.David@epa.gov>
Subject: RE: EPA Comments - Revised Mitigation Plans - Residences #21, 84/85, 105/124/125 - Please submit revised plans responsive to comments by Friday, Dec. 4th

Melanie:

Attached are revised mitigation plans to address your comments, as well as a letter explaining the revisions responding to each of your comments.

J. Wesley Hawthorne, PE, PG
Senior Vice President

Locus Technologies
299 Fairchild Dr.
Mountain View, CA 94043
415-799-9937
hawthornej@locustec.com
www.locustec.com

Operations & Maintenance (O&M)
SMDS Mitigation System Performance Inspection Field Form

Inspector/Company: _____
 Location/Address/RES#: _____
 Client/RP: _____

type in post-mitigation implementation data and compare to subsequent inspection measurements

Visual System Checks	Date	Time	Condition (Good or Poor*)	Initial System Measurements	Date	Time	Vacuum ("wc)**	Flow (CFM)	Within 25% (Y/N)
Fan#, _____				Fan _____					
Piping upstream of fan				Current System Measurements	Date	Time	Vacuum ("wc)**	Flow (CFM)	Within 25% (Y/N)
Riser Pipe				Fan _____					
Exhaust Varmint Guard				Performance Sampling	Date	Time			
Audible Alarm				Indoor Air Sample(#-1):					
Plumbing Box Out				Indoor Air Sample(#-2):					
System Manometer				Indoor Air Sample(#-3):					
System Labeling				Indoor Air Sample(#-4):					
Riser Pipe Seals				SMDS Discharge Sample					
Liner Breaches/Damage				Outdoor Air Sample					
Liner Edge Seals									
Owner/Tenant has current information/Notification sheet									

Manometer, micromanometer, and/or velometer calibration certificate(s) must be filed as QA-backup with inspection reports to EPA

*a "poor" finding necessitates corrective action and inclusion in periodic reporting to EPA.

**SMDS Vacuum is measured in the piping downstream of the vapor collecting pipe network and upstream of the fan applying the vacuum.

#Fan numbering should be unique to Triple Site mitigation network for future comparisons

Performance Data and preliminary indoor air and SMDS system discharge sample data submitted to EPA: (Yes/No//Date): _____

Validated indoor air data submitted to EPA within 5 days of receipt from the data validator: (Yes/No//Date): _____

Changed Conditions or Anomalies (change in flooring or joints/new utility lines or services//change in dirt flooring such as earthquakes/heavy rain or flood/fires or accidents/change in owner/occupant//System shut-off or failed/notification worked:

see for reference: Residential Vapor Intrusion Mitigation System Operations and Maintenance Plan, 52nd Street Motorola Superfund Site Operable Unit 1 Area, Phoenix, Arizona, Freescale Semiconductor, Inc., June 2013.