

Health Effects Evaluation of Part 2 of Phase II data for the Hillcrest Community Environmental Investigation (HCEI)

1.0 Background

1.1 Phase I Summary

The initial phase (Phase I) of the HCEI was a passive soil gas (PSG) survey to obtain passive soil gas data to screen the Hillcrest Community and areas adjacent to the refinery sector for potential volatile organic compound (VOC) impacts to groundwater.

In summary, based on Phase I results, no significant widespread masses of chemicals of concern were observed via this screening methodology. Additional information about Phase I results are available online at: <http://www.tceq.state.tx.us/implementation/tox/research/hillcrest-community-environmental-investigation/hillcrest-community-environmental-investigation-phase-i/>.

1.2 Part 1 of Phase II Summary

The TCEQ sampled both groundwater and subsurface soil as part of Part I of the Phase II investigation. The US Environmental Protection Agency (EPA) also conducted split samples of the groundwater and subsurface soil borings. Specifically, the EPA collected and analyzed ten percent (10%) of the subsurface soil borings and one hundred percent (100%) of the groundwater samples in Part I of Phase II of the HCEI. Figure 1 shows the groundwater and subsurface soil boring locations. The Toxicology Division (TD) evaluated the groundwater and soil data for Part I of Phase II of the HCEI from a health effects perspective to identify potential health concerns and reported no potential for adverse health effects to occur. The report is available at http://www.tceq.state.tx.us/assets/public/implementation/tox/hcei/phase2/health_effects_evaluation.pdf.

2.0 Health Assessment

2.1 Chemicals of Potential Concern (COPCs)

In April 2011, the TCEQ conducted a second groundwater sampling event (Part 2 of Phase II) in which groundwater wells previously sampled were re-sampled for potential seasonal variations

in the chemicals of potential concern (COPCs). The primary COPCs are still considered to be benzene, toluene, ethylbenzene, xylene, naphthalene, and total petroleum hydrocarbons (TPHs). Out of abundance of caution, and at the request of the representative for the Citizens for Environmental Justice (CFEJ), the TCEQ also analyzed for the full suite of volatile organic compounds (VOCs), polycyclic aromatic hydrocarbons (PAHs), and TPH. In addition, Sulfolane was also added to the target analyte list for groundwater samples during Part 2 of Phase II. Additional information on the target analyte list, procedures for sample collection, data validation, and laboratory analysis is available in the Final Field Sampling Plan for Phase II of the HCEI and is also available online at:

<http://www.tceq.state.tx.us/assets/public/implementation/tox/hcei/phase2/final%20fsp.pdf>.

Detailed definitions of the terms used in the evaluation are available at:

<http://www.tceq.texas.gov/implementation/tox/research/hillcrest-community-environmental-investigation/hillcrest-community-environmental-investigation-phase-i#facts>.

2.2 Sampling Event

In order to take into account potential seasonal variations of the COPCs, Part 2 of Phase II of the HCEI was conducted. This Part included one groundwater sampling event that took place during April 26 – 28, 2011, representing a different season than Part 1 of Phase II. Both the TCEQ and US EPA collected and analyzed split samples during this sampling event. The groundwater sampling data is available at <http://www.tceq.texas.gov/toxicology/research/hillcrest-community-environmental-investigation/hillcrest-community-environmental-investigation-phase-ii>.



Figure 1: Phase I and Phase II Sampling Locations

The TCEQ conducted two groundwater sampling events during two different seasons to account for potential seasonal variation. The TD reviewed all the groundwater data for Part 2 of Phase II of the HCEI from a health effects perspective to identify any potential health concerns.

2.3 Texas Risk Reduction Program Protective Concentration Levels

The TCEQ follows the Texas Risk Reduction Program rule (TRRP) for hazardous waste sites to determine if concentrations of COPCs are above a level of concern in various media, including soil and groundwater.

The TRRP rule identifies cleanup levels in water and soil called Protective Concentration Levels (PCLs) for many chemicals. These PCLs are for specific chemicals and set below levels where adverse health effects would be expected to occur; they are set to protect children and other sensitive members of the populations. The TRRP is a very cautious, conservative approach to evaluate if adverse health effects could potentially occur from long-term exposure to COPCs in groundwater and soil. For the calculation of the PCLs, the TRRP assumes that you are exposed to many pathways at the same time, daily, over a long period of time. Actual exposure may be much less than what the PCLs assume. If the concentration of a chemical is detected at or below the PCL, adverse health effects are not expected to occur. If a chemical is above the PCL, it does not necessarily mean that adverse health effects would occur, but we would take a closer look at what action is required under the rule. All the groundwater sample results with their respective PCLs are included in Tables 2.2 a to 2.2 f and are available online at the HCEI Phase II webpage with this report. Additional information on the TRRP PCLs can be accessed online at <http://www.tceq.texas.gov/remediation/trrp/trrppcls.html>.

More information about phase II of the HCEI is available online at: http://www.tceq.texas.gov/implementation/tox/research/hillcrest.html#phase2*.

For a more detailed explanation of some of the terms used in the health effects evaluation, please refer to the fact sheets at: <http://www.tceq.state.tx.us/implementation/tox/research/hillcrest-community-environmental-investigation/hillcrest-community-environmental-investigation-phase-ii#facts>.

2.4 Evaluation

The Hillcrest community continues to get its drinking water from the City of Corpus Christi - O.N. Stephens Water Treatment Plant. As previously reported, the drinking water is monitored by the city, who reports to the TCEQ on a regular basis. The water supplied to the Hillcrest community is suitable for drinking and household use. Therefore, it is not expected that there would be oral exposure to the groundwater under the community via drinking water for the Hillcrest community. Some chemicals, depending on their chemical/physical characteristics, can potentially move from groundwater into ambient air where a person could breathe their vapors. For that reason, the TD used groundwater-to-air PCLs to evaluate the possibility that potential pathway of exposure from groundwater-to-air could be of a health concern. These levels are referred to as TRRP Residential Tier 1 ^{Air}GW_{Inh-V} PCLs.

The measured levels of all VOCs, PAHs, and TPH from both TCEQ and EPA groundwater samples were below their respective TRRP Residential Tier 1 ^{Air}GW_{Inh-V} PCLs. Exposures to the reported levels of VOCs, PAHs, and TPH in the groundwater are not expected to result in adverse health effects. In summary, no significant groundwater contamination was found under any residential property from Part 2 of Phase II.

3.0 Conclusions

Exposures to the reported levels of VOCs, PAHs, and TPH in groundwater from Part 2 of the Phase II HCEI are not expected to cause adverse health effects, even in potentially sensitive populations such as children.

In summary, exposures to the reported levels of the VOCs, PAHs, and TPH from Part I of the Phase II HCEI groundwater and subsurface soil sampling and Part 2 of the Phase II HCEI groundwater sampling are not expected to cause adverse health effects, even in potentially sensitive populations such as children.