

## Phase II Investigations: A Comparative Data Analysis

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### How Worried Do I Need to Be?

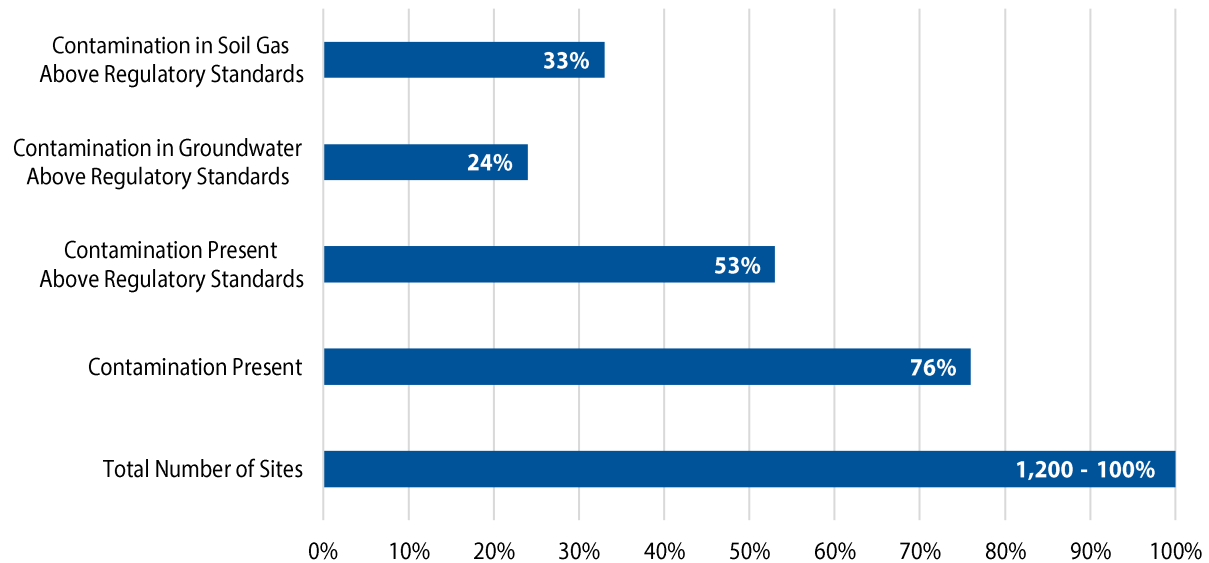
At Partner, when a client gets a Phase I ESA back and is faced with a Recognized Environmental Condition (REC) and Phase II Subsurface Investigation recommendation, we often field questions like “how worried do I have to be” and “do I have to do a Phase II ESA”? We thought it would be valuable to the commercial real estate industry to provide statistics based on real data from Phase II ESAs to help inform the industry about how often contamination is encountered during a Phase II investigation.

We tapped into our years of expertise and poured through data to identify trends that might help both real estate and environmental professionals make more educated risk decisions. We analyzed data from 1,200 Phase II ESAs and the result was phenomenal. The data showed us an interesting story about how often contamination was found during Phase II investigations. As shown in the table below, of the 1,200 sites, 76% of Phase II ESAs detected *some* contaminants (above laboratory reporting levels) and 53% of those Phase IIs detected more significant contaminant levels (above regulatory action levels). It should be noted that groundwater and soil gas are as significant as soil data, as both can indicate a larger human health risk problem.

To translate, three out of four Phase II ESAs had indications of contamination and of those reports, one out of two investigations had levels of contamination that exceed a regulatory action level, which may require some type of additional assessment or remedial action.

To further analyze what specific sources of contamination were most worrisome, we looked at eight features that often lead to Phase II recommendations. The data differs slightly for each feature type as you'll see below, but for all features the data validates that contamination is indeed “likely” (greater than 50%).

### Summary Findings



### Presence of Contamination by Feature

Feature	Sites with Contamination	Sites with Regulatory Exceedances	Sites with Regulatory Exceedances in Groundwater	Sites with Regulatory Exceedances in Soil Gas	Risk Category (Based on Overall Regulatory Exceedances)
Hydraulic Lifts	56%	19%	N/A	N/A	Low
Oil Water Separators	72%	27%	7%	44%	Moderate
Off-Site Issues	70%	30%	21%	20%	Moderate
Heating Oil USTs	70%	40%	30%	66%	Moderate
General Auto Repair	76%	40%	22%	60%	Moderate
Historical Manufacturing with Potential Solvent Use	80%	46%	20%	46%	Moderate
Funeral Homes	64%	48%	40%	N/A	Moderate
Dry Cleaners	87%	54%	38%	27%	High

**Hydraulic Lifts:** Releases from hydraulic lifts are typically localized around the piston and hydraulic reservoir, which are underground. Hydraulic oil is heavy and not very mobile, so unless groundwater is very shallow, groundwater contamination is not usually a concern, as is reflected in the data above. In addition, PCBs, a toxic and environmentally persistent chemical in hydraulic fluids are a concern for hydraulic lifts installed before 1978. Soil gas surveys aren't commonly conducted for these features, mainly due to the localized nature of the contamination; in other words, the small area of soils contamination associated with a leaking hydraulic lift reservoir is easily removed via excavation and doesn't typically pose a threat to human health.

**Oil-Water Separators:** Oil-water separators have holding tanks and piping that can be compromised over time. When these features are associated with auto repair and/or industrial uses, especially when chlorinated solvents are used, soil and groundwater contamination can result if these features are compromised. When solvents are present in the waste streams that oil water separators are receiving, the resulting contamination can also lead to potential vapor intrusion conditions.

**Off-Site Issues:** Off-site issues can include regional groundwater plumes, dry cleaners, gas stations, and other commercial and industrial properties that might impact occupants. Off-site issues can often cause a threat to human health that can be equal to or exceed an on-site issue. In the table above, regulatory exceedances are significant and occurred in one in three projects. It may be surprising and difficult to understand why an environmental issue that didn't even originate on your property could pose a threat; however, it is important to remember that contamination travels beneath the ground surface through groundwater and through the air spaces that exist in between soil particles. The results above clearly demonstrate the importance of addressing off-site issues during due diligence.

**Heating Oil USTs:** Heating Oil USTs are tricky because, in most states, they are exempt from regulation (but some states, such as New Jersey do

have regulatory programs). Since they are often not regulated, heating oil USTs often have a false reputation of not being as risky; however, heating Oil USTs do leak, just like a gasoline UST would at a gas station. Although generally less extensive, there is still a cost to cure and environmental liabilities can be significant. Additionally, heating oil USTs can pose assessment and removal problems that other tanks don't have due to their placement in difficult places like basements and public right of ways.

**General Auto Repair:** Auto repair operations typically use petroleum products and chlorinated solvents; however, the main concern with auto repair operations is whether these petroleum products and chlorinated solvents have a means to reach soil and groundwater. These contaminants can reach the subsurface through features like floor drains, sumps, oil water separators, and sand traps. When this occurs, contaminants persist in the subsurface and can cause potential vapor intrusion issues.

**Historical Manufacturing with Potential Solvent Material Use:** When the historical use of a property includes industrial use, particularly manufacturing that occurred prior to regulatory oversight, it is very likely that hazardous materials used in the operations included solvents that could have impacted the subsurface. These types of facilities have results similar to that of drycleaners - indicating that these facilities should raise a red flag during due diligence. Often, these types of facilities are overlooked, especially if they operated during a time prior to regulatory oversight.

**Funeral Homes:** Contamination from funeral homes occurs primarily when embalming fluid containing heavy metals enters the subsurface through a compromised septic system. Neither the fluid nor the metals pose a concern for vapor intrusion, as the data shows. Vapor intrusion is typically not a problem with funeral homes based on the nature of the contamination; however, a cleanup of metal impacted soils or groundwater can be costly.

**Dry Cleaners:** Close to 90% of dry cleaners studied resulted in detectable contamination, with more than 50% of these sites showing an exceedance of regulatory screening levels. Dry cleaning chemicals, even when properly used, managed, and disposed of are hazardous to the environment and human health. In fact, the US SBA now requires Phase II ESAs on all drycleaner properties, regardless of age and duration of use. The main chemical of concern associated with dry cleaners is PERC (PCE). PERC became the predominant dry cleaning chemical in the United States starting in the 1930s and 1940s. Prior to that, petroleum-based solvents were used.

After PERCs introduction to the dry cleaning industry in the early 1930s, it then became the most widely used dry cleaning solvent due to its cleaning efficacy. In 2008, after almost 80 years of PERC use in the United States, the EPA identified PERC as a probable human carcinogen. Presently, there are more than 30,000 dry cleaning operations in the U.S. About 85% of these facilities use PERC as the primary cleaning solvent. Though most dry cleaners use less than 140 gallons of PERC per year, the cumulative impact from these numerous facilities is significant. Of note, the EPA's final air rule dated July 13, 2006 requires a phase-out of PERC machines co-located in residential buildings by December 21, 2020 and California enacted a law in 2007 that requires all PERC dry cleaning to be phased out by 2023.

### Remedial Costs

Remedial costs associated with environmental contamination can be significant. An analysis, based on 145 remedial cost estimates prepared by Partner, was conducted for some of the property types in the study.

The remedial cost estimates in the following table consist of the costs to investigate and remediate a site. They do not include other significant costs, damages, and other expenses such as loss of revenue due to the uninhabitability of the site, stigma damages, diminution in value, and potential liability associated with the contamination migrating

beyond the boundaries of the site, implicating property damage claims from adjacent landowners.

#### Average Remedial Cost Estimate (\$)

Property / Feature	20% Confidence Level	Average	80% Confidence Level
All Sites	350,000	590,000	1,050,000
USTs	400,000	485,000	910,000
Auto Dealerships	40,480	166,000	360,000
Dry Cleaners	255,750	380,000	1,000,000

### Conclusion

This study showed that 76% of Phase II ESAs have some level of contamination and half of the sites studied had contamination above regulatory action levels. It also showed that many of the property types we studied are low to moderate risk. When assessing these properties in the context of a commercial real estate transaction, knowing the frequency of contamination associated with these property types is crucial.

So how worried do commercial real estate professionals need to be when presented with a recommendation for a Phase II in a Phase I ESA? The right answer here is to avoid the worry by being armed with the knowledge that potentially 1 in 2 Phase II ESAs result in contamination that may need to be remediated and that those remediation costs could be significant. There are no regulatory requirements to perform a Phase II ESA; however, many lenders do have their own triggers for Phase II ESA requirements. Remember, when Phase II ESA data exceeds a regulatory action level, it is likely that some type of remedial action may be required and the cost to remediate the property types in this article can vary from three hundred thousand dollars to upwards of a million dollars.