Message

From: Getty, Donna J. [Donna.J.Getty@leidos.com]
Sent: 1/22/2018 3:36:04 PM
To: LEE, LILY [LEE.LILY@EPA.GOV]
Subject: RE: EXTERNAL: What if 16 targeted? FW: Hunters Point Naval Site - Explanation of Item Sampling

90%

From: LEE, LILY [mailto:LEE.LILY@EPA.GOV]
Sent: Monday, January 22, 2018 10:22 AM
To: Getty, Donna [US-US] <Donna.J.Getty@leidos.com>
Subject: Re: EXTERNAL: What if 16 targeted? FW: Hunters Point Naval Site - Explanation of Item Sampling

What $percent confidence if 16 target ed and zero random?

Sent from my iPhone

On Jan 22, 2018, at 4:47 AM, Getty, Donna J. <Donna.J.Getty@leidos.com> wrote:

> You need to collect 7 random in addition to the 16 targeted.
>
> ---
>
> **From:** LEE, LILY [mailto:LEE.LILY@EPA.GOV]
> **Sent:** Monday, January 22, 2018 4:02 AM
> **To:** Getty, Donna [US-US] <Donna.J.Getty@leidos.com>
> **Subject:** EXTERNAL: What if 16 targeted? FW: Hunters Point Naval Site - Explanation of Item Sampling
>
> I just realized you said 16 random = 61% confidence. What if 16 are targeted?
>
> ---
>
> **From:** Getty, Donna J. [mailto:Donna.J.Getty@leidos.com]
> **Sent:** Friday, January 19, 2018 11:48 AM
> **To:** LEE, LILY <LEE.LILY@EPA.GOV>; Barnett, Felicia <Barnett.Felicia@epa.gov>
> **Cc:** richard.m.leuser <richard.m.leuser@leidos.com>
> **Subject:** Hunters Point Naval Site - Explanation of Item Sampling
>
> Lily,
>
> Below is a brief description of item sampling in respect to how it may be applied to Hunter Point.
>
> **PRESENCE/ABSENCE SAMPLING**
> The potential for the use of presence/absence sampling as a method for clearance has been discussed with the EPA Regulators. Visual Sample Plan (VSP) software was used to compute some possible scenarios as a demonstration of how item sampling works. The population of Trench Units (TUs) (N=63) located on Parcel G are used as an example. In this design, each TU is considered to be an item. Sampling results are categorized as binary as per VSP:
> "...this design requires that each sample result be categorized as a binary outcome, such as 1) the presence or absence of a particular quality, 2) a sample result being acceptable or unacceptable as defined by an action level threshold, 3) contamination being detected or not detected, etc. "
> Additionally,
> "The objective of this design is to demonstrate, with high probability, that a high percentage of the decision area (or population) is acceptable, where none of the observed samples may be unacceptable."
> For Parcel G:

1) The 2 levels of confidence are set. For example, "I want to be 95% confident that 95% of the 63 TUs are acceptable."
2) A decision is made whether to include targeted TUs in addition to randomly selected TUs. This also requires, an input as to how much more likely the targeted TUs are to be unacceptable as compared to the remaining TUs. For example: "I believe that a target TU is 2 times more likely to be unacceptable"
3) Based on the above two inputs, the number of targeted and the number of random TUs to be evaluated is computed using VSP.
4) Each of the TUs selected for evaluation undergo (a subset of the 63 TUs) a MARSSIM Class 1- based scan/sampling process.
5) If at the end of the Class 1 process for the subset of TUs, any of the evaluated TUs is determined to be unacceptable, then the preset confidence levels will no longer hold, and it requires all TUs undergo a MARSSIM Class 1 process.

Some example calculations are presented below.
For a sampling design where all TUs for evaluation are selected randomly:

- If one wants to be 99% confident that 95% of the items (TUs) are acceptable then 48 TUs selected randomly must meet criteria.
- If one wants to be 95% confident that 95% of the TUs are acceptable then 39 TUs selected randomly must meet criteria.
- If one wants to be 61% confident that 95% of the TUs are acceptable then 16 (25% of 63) TUs selected randomly must meet criteria.

For a sampling design with targeted and randomly selected TUs:

- If I believe that a targeted TU is 2 times more likely to be unacceptable and I want to sample 16 targeted TUs then I need to sample an additional 7 random TUs. If all of the combined (random and targeted) TUs meet criteria then I can be at least 95% confident that 95% of the TUs meet criteria.

UNCERTAINTIES

Item sampling is not included in MARSSIM and is not typically used in this manner. It applies to grid cells across a region (a wall, a floor, etc), a group of drums, etc. where a single sample (wipe sample) dictates the presence/absence of the contamination. For Hunters Point, the Class 1 MARSSIM approach requires scanning 100% of the region followed by multiple sample collection and statistical analysis. The final binary answer, acceptable or unacceptable, is based on multiple lines of evidence not a single sample.

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<image001.png>