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# Identification technical guide for clean-up of POPs contaminated sites

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## **1. The purpose of compilation**

In the process of cleaning up pesticides POPs polluted sites, usually generate a lot of waste pollution may be affected by the POPs, these waste whether to belong to POPs waste is also a lack of a specific identification standard. For better implementation of the China persistent organic pollutants waste harmless environment management and disposal project ", promoting POPs waste disposal and polluted site harmless management and guide the solid waste management department of the local site cleaning waste pollution survey to identify, ensure the scientific and accurate data, formulate POPs pollution site cleaning waste identification guide.

## **2. Compilation basis**

Law of the People's Republic of China on the Prevention and Control of Environmental Pollution Caused by Solid Waste

The People's Republic to perform 'on the Stockholm convention on pops' national implementation plan

National hazardous waste list

HJ/T 20-1998 industrial solid waste sampling sample preparation technical specifications

GB5085-2007 standard identification of hazardous waste

HJ/T298-2007 standard of hazardous waste technical specifications

Hazardous waste storage pollution control standard (GB18597-2001)

Hazardous chemical materials safety labels to write to the (GB/T 15258-94)

Dangerous goods transport packaging general technology conditions (GB12463-90) :

Commonly used dangerous chemicals general storage (GB15603-1995)

## **3. Main waste type**

POPs pollution of waste site cleaning including the main types:

- (1) Construction waste: including tiles, cement, etc.;
- (2) packaging waste: including costumes pesticides glass bottle (barrel, cylinder), plastic bottles (barrel, cylinder), all kinds of packing paper, sacks (with), foam, packing boxes, etc.;
- (3) Abandoned equipment waste: polluted various production machinery and accessories, etc.;
- (4) Pollution soil: including clean up contaminated soil in production workshop, inventory workshop, and Waste dumps etc.
- (5) Other waste, those may be pesticides of liquid waste, from the raw material and other waste.

POPs pollution in the process of packaging waste site cleaning and abandoned equipment waste, belongs to the POPs waste, need not identified. The following identification method is mainly for construction waste, pollution of soil, the other waste, etc.

## 4. Identification method

### 4.1 Sample

#### 4.1.1 The sampling object

According to the classification of waste pollution site cleaning and identify target, to determine the sampling object under different category.

#### 4.1.2 Sample number and sample quality

According to the total amount of waste, determine the minimum sampling number based on table 1.

Table 1 Solid waste collection of minimum sample number

Solid wastes (q/t)	Sample number (count)
$q \leq 5$	5
$5 < q \leq 25$	8
$25 < q \leq 50$	13

$50 < q \leq 90$	20
$90 < q \leq 150$	32
$150 < q \leq 500$	50
$500 < q \leq 1000$	80
$q > 1000$	100

If the waste is historical stockpiling state, sample should be based on the total amount, and choose the least sample number according to the table 1. The sample quality should also meet the needs of the analysis of the operation. If the waste is solid, the sample quality also should be in accordance with the follows: if the maximum diameter of the original particle is bigger than 0.5 cm, the sample quality should take 500g or more; if the maximum diameter is between 0.5 and 1.0 cm, take 1000 g or more,; if the maximum diameter is bigger than 1.0 cm, take 2000 g or more.

### 4.1.3 Sampling method

(1) according to the waste character, the solid waste sample should take respectively by using long shovel type sampler, sleeve type sampler or probe sample;

The liquid waste sample should take sampling spoon, sampling pipe, sampling bottles.

For semi-solid waste, according to the waste character, take the liquid or solid waste sampling method respectively.

(2) sampling tools and sample containers require metal, glass, PTFE material, prohibited the use of plastic, rubber and other congener materials , the sample containers also requires can seal.

Sampling procedures and sampling record should take under HJ/T 20.

(3) Loose accumulation of waste

Stacking height is less than or equal to 0.5m of the bulk accumulation of solid, semi-solid waste, waste pile tile thickness of 10-15cm rectangle, divided into 5N (N is the number of samples, the same below) of equal area net grid, sequentially numbered; Extracted N grid as a sampling unit using a random number table method in HJ/T 20, vertically take full thickness of the waste in the center of the grid position with sampling shovel or spade. Take each grid of the waste as a sample.

For number of stacking height is less than or equal to 0.5m bulk accumulation of solid waste, Select the accumulation time of a minimum of waste heap, taken in accordance with the bulk accumulation of solid waste sampling method.

Stacking height is greater than 0.5m of the bulk accumulation of solid, semi-solid waste, should be stratified to take samples; sampling layers should not be less than two layers, According to solid, semi-solid waste accumulation height equal interval layout; the number of samples each floor should be equal. Stratified sampling can use the sample drilling or mechanical drilling.

#### (4) Storage pool and waste in containers

For the storage pool waste, divided into 5 N area of equal grid, order Numbers; Use HJ/T 20 in random access method extracting N grid as sampling unit to take samples. Sampling, in the center of the grid vertical insert waste bottom with soil sampler or long shovel type sampler, rotate out after 90 DHS, as a copy of samples. The thickness of the waste in the pool is equal to or greater than 2 m, should be divided into the upper (depth of 0.3 m place), central (1/2 depths), and at the bottom (5/6 depths) three layer to take samples; number of samples each layer equals.

For waste in bags, barrel etc containers, order Numbers each container, using a random number table method in HJ/T 20 extracted  $(N + 1) / 3$  (rounded to the nearest integer) bags as the sampling unit to take samples. According to solid waste characters use long shovel type sampler, sleeve type sampler or probe sample respectively. Open the vessel mouth, each container is divided into the upper (1/6 depths), central (1/2 depths), and at the bottom (5/6 depths) three layer to take samples; number of samples each layer equals. If there is only one container, the container should be divided into three layers according to the above methods, each layer take two samples.

#### (5) Liquid waste

According to the size of the container sample with glass sampling pipe or heavy bottles of sampler. Blend liquid waste in container (containing volatile components of liquid waste except) then open the container, slow insert liquid surface to the bottom of the container with sampling pipe or heavy glass bottle sampler from the center of the vessel mouth; When the sampling tube / sampler is filled with liquid waste, slowly raised, and inject the sample into the sample container.

(6) In order to ensure does not cause secondary pollution, take the necessary personal security measures in the sampling process

(7) Complete the record sheet in accordance with the sampling situation (table 4-1).

Table4-1 contaminated sites clean-up waste sampling records / registration form

Sample Registration Number		Sample Name	
Sampling locations		Number of samples	
Sampling time		The unit name the waste belongs to	
A brief of the Sampling site			
A brief of the waste generation process			
The main harmful components the waste may contain			
Sample preservation methods and precautions			
Sample collection and acceptance of people			
Remarks		Authorized Signature	

#### 4.1.4 Sample preparation and save

The samples should be saved with portable refrigerator or dry ice and transport to the laboratory as soon as possible. If the samples cannot be analyzed in the short term, store below 4 °C. The sample should not be more than 30 days below -10 °C.

The preparation of sample is to make in accordance with the requirements in HJ / T 20, prohibit the use of plastics, rubber and other materials. The prepared samples were sealed in containers (containers stored in the sample should not produce adsorption and sample deterioration), labeled for spare. Those should be indicated on the label: number, name of the waste, sampling locations, batch number, samples, and sample preparation time.

#### 4.2 Sample Analysis

Sample extraction, purification and instrumental analysis reference to the standard method of U.S.A. EPA for the POPs analysis and determination, there are: EPA Method 505 EPA Method 508 EPA Method 608 EPA Method 617 EPA Method 625 EPA Method 8080A, the EPA Method8081, and EPA Method 8250.



Target of the analysis is determined according to the source of contamination of the contaminated sites. Including DDT, hexachlorobenzene, chlordane, mirex, toxaphene.

### **4.3 Quality control and quality assurance**

(1) In the process of sample collection, preservation, transportation, transfer, a complete management program should be established. In order to avoid sampling equipment, and external environmental conditions and other factors affect the sample, quality assurance and quality control process should be focused on in the field sampling.

(2) To prevent cross-contamination in the sampling process, sampling tools should be reused cleaning.

(3) Sampling for quality control in collection site is an important means of field sampling and laboratory quality control. Samples of quality control generally include parallel samples, blank samples, transport samples and washing blank control sample, sample of quality control can be analyzed to implement the quality control at different stages from sample to sample transport, storage and data analysis.

(4) Other technical requirements for quality control and quality assurance reference to the HJ / T 298 related.

(5) Quality control of POPs analysis reference to EPA provisions of POPs analytical quality control methods.

### **4.4 Test results**

(1) In the detection process, if the detection results of one kind of contaminant (containing different with the Department of thing's, fellow objects of and calculation)  $\geq 50$  mg / kg or  $\geq 50$  mg / L, the waste can be determined with POPs waste characteristics.

(2) When the waste contains a variety of POPs, calculate the total content of all POPs substances.

(3) When the waste in a different state (such as liquid, solid, and semi-solid) mixed, measure the POPs content in waste according to the different forms respectively.

(4) After the waste samples testing, if the test results  $\geq 50$  mg / kg, or 50 mg / L, the number

of samples greater than or equal to the lower limit of the number of copies of sample exceeds the standard in Table 2, This waste can be determined to belong to the pops waste.

Table 2 a normal tests sampling plan

Sample number (count)	The lower limit of the number of copies of sample exceeds the standard
5	1
8	3
13	4
20	6
32	8
50	11
80	15
100	22

(5) If the number of the solid waste samples taken doesn't match with the sample number in Table 2 , choose the smaller number of samples closest to the actual number of samples, then judge by table 2.

(6) Other discrimination with reference to HJ / T 298-2007.