

SUBJECT: INVESTIGATION DERIVED-WASTE GUIDANCE

PURPOSE: The purpose of this guidance is to define the acceptable approaches to handling Investigation Derived Wastes (IDW) generated during site assessments.

BACKGROUND:

Field investigation activities (e.g., site investigations, remedial investigations /feasibility studies, remedial designs, etc.) result in the generation of materials that are defined as waste under Ohio Administrative Code (OAC) §3745-51-02. Such wastes may come under the purview of a number of federal and state statutes and regulations. For instance, the wastes may contain hazardous substances as defined by the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). Furthermore, some CERCLA hazardous substances are hazardous wastes under Ohio Revised Code (ORC) § 3734.01 (Q) and are regulated by the Division of Hazardous Waste Management. Other hazardous substances may be regulated by additional federal or state laws such as: the federal Toxic Substances Control Act (TSCA); Water Pollution Control Act (ORC § 6111); Air Pollution Control Act (ORC § 3704); and the Safe Drinking Water Act (ORC § 6109). Even if a derived solid or semi-solid material is not found to be hazardous under any of the above statutes, it could be classified as solid or infectious waste under ORC § 3734.01 (E) and regulated by the Division of Solid and Infectious Waste Management.

There are several types of IDW generated during the investigations. Typically, these include the following: (1) soil cuttings, (2) drilling mud from soil boring and well installations; (3) purge water removed from wells during well development and prior to collecting ground water samples; (4) sediments and (5) sludges; (6) water, solvents, or other fluids used to decontaminate field equipment and Personal Protective Equipment (PPE); (7) PPE and Disposable Equipment (DE); etc.

Management of IDWs can be a difficult task. Proper storage and disposal actions are necessary to comply with statutory requirements. Furthermore, even though these regulations may be applicable, relevant and appropriate requirements (ARARS) to handling IDWs, they do not specifically address the management of IDWs and in some cases the regulations are not

practicable requirements for specific sites and wastes. In order to ensure proper handling and compliance with the rules, Ohio EPA divisions undergo long term discussions and negotiations with investigation involved parties. This policy intends to streamline storage, analysis and disposal actions for the identified waste categories and set ground rules that will alleviate confusion.

Since there is no statutory framework regarding IDWs, handling of IDWs for sites that fall under DERR's jurisdiction could be challenging. The two available management options that drive all decision making are the Superfund approach and the legal interpretation of how and to what extent regulations apply to investigation activities.

SUPERFUND APPROACH

Superfund's strategy for managing IDW is presented in the EPA guidance document EPA/540/G-91/009 "Management of InvestigationDerived Waste During Site Inspections" which presents a general regulatory background and options for management of IDWs during Superfund site inspections. The same approach was reiterated in the Office of Solid Waste and Emergency Response (OSWER) Publication: 9345.3-03FS "Guide to Management of Investigation Derived Wastes" which pertains to wastes generated in other CERCLA investigation activities (e.g. remedial investigation/feasibility studies, remedial designs, etc.). The Superfund management approach considers options that are protective of human health and the environment and comply 'with ARARs (unless they are waived) and recommends numerous management options for specific type of wastes. Furthermore, Superfund supports the use of best professional judgement, in light of the site specific conditions, to determine protectiveness of a selected management option. However, the IDW management options selected by Superfund and other involved parties are not always in agreement with Ohio EPA's preferred approach. Disagreements on management options necessitated the development of this policy which presents Ohio's management option for a specific type of waste. If more than one available option is suggested for a specific type of waste, rationale for selecting the preferred option will be presented. Since there are numerous IDW scenarios that the policy may not directly address, DERR realizes that there is still room for professional judgment. The policy will be updated on an "as needed" basis to account for unique scenarios not currently addressed. This will allow us to set precedence for future decisions regarding similar types of situations.

OHIO's REGULATORY APPROACH

Investigations generate wastes that have to be managed in accordance with the law. These regulations, however, are written primarily for industrial generators of waste. On June 12, 1992, DERR issued the ARARs Policy which identifies all substantive requirements that CERCLA generators of waste need to comply with. The issue examined by this policy is whether compliance with all state and federal regulations is practicable for all IDW since most investigations generate only small volumes of wastes, and compliance with all ARARs is both time consuming and not cost effective. Also, the purpose of the investigations is not to address contamination, but rather to gather information about the site. It is more desirable to use resources for determining the extent of the problem than to limit the scope of the investigations due to cost and time restraints associated with complying fully with ARARs. "Practicability" is a realistic approach taking into consideration whether the IDW would significantly increase risks to human health and the environment. This policy identifies disposal actions that are protective of human health and the environment for a specific type of waste and generated process. On-site temporary and permanent disposal options are deemed necessary for wastes that leave conditions essentially unchanged at the site. Off-site disposal options are selected for wastes that are characterized and found to contain hazardous substances in concentrations that need to be managed in accordance with regulations.

POLLUTION PREVENTION

Prior to investigations, project managers and/or investigative personnel must consider pollution prevention practices that will minimize the generation of wastes. Whenever possible, care should be taken to utilize both equipment and procedures that will eliminate or, at a minimum, reduce the amount of wastes generated during all activities associated with investigations. Examples include employing drilling equipment and/or procedures that will not generate cuttings or drilling mud, reusable or dedicated sampling equipment, non-toxic detergents, procedures which reduce or eliminate the use of solvents in deconning, sampling techniques and planning that will minimize the generation of wastes, etc. Investigators and responsible parties are strongly recommended to use and apply EPA's guidance document EPA/600/R 92/008 "Facility Pollution Prevention Guide" as well as Ohio EPA's,

"Ohio Pollution Prevention and Waste Minimization Planning Guidance Manual".
Implementation of pollution prevention activities during investigations will reduce the amount of IDW being generated as well as serve as an economic benefit to the investigative parties.

GUIDANCE This section consists of four sub-parts:

1. DEFINITIONS:

Soil Cuttings: a) soil which is displaced during soil boring or monitoring well installations; b) soil which is removed with an auger and is not used as the sample to be analyzed.

Drilling Mud: waste generated when drilling fluids employed in a drilling process mixes with the soil being displaced and creates a mudtype waste.

Sludge: any solid, semisolid, or liquid waste, generated from a municipal, commercial, or industrial wastewater treatment plant, water supply treatment plant, or any other pollution control facility exclusive of the treated effluent from a wastewater treatment plant.

Sediment: particle-sized distributions of previously suspended material (depending on particle diameter, could be clay, silt, sand, etc) which have been deposited by some geological agent such as water, wind, ice, or gravity.

Purge Water: water collected from a well before a sample is collected for analysis. The amount to be purged can be determined using dimensions of the well and depth to the ground water table. Generally, three times this amount of water should be removed from the well, containerized, and stored until analytical results have been received.

Decontamination Fluids: water, solvents, and other fluids used to decontaminate field equipment and PPE.

Placement: the disposal, in or on land, of RCRA hazardous waste, including but not limited to a landfill, surface impoundment, injection well, or land treatment facility. Placement also occurs when: a) wastes collected from different areas of contamination are consolidated into one area; b) wastes are moved off-site for treatment and storage; c) wastes are excavated from an area of contamination, transferred to a separate unit (i.e. tank, surface impoundment, incinerator, etc.) and redeposited on-site. Essentially, any IDW which cannot be disposed of or replaced to its source on-site will require "placement".

2. CRITERIA USED FOR SELECTING APPROPRIATE MANAGEMENT OPTION (RESPONSE ACTION)

MAIN OBJECTIVE Storage and disposal actions must be protective of human health and the environment.

SECONDARY OBJECTIVE Employ sampling equipment and techniques that do not interfere with the integrity of the collected sample and minimize the quantity of generated waste. Adopt waste minimization methods that reduce IDW handling problems.

CRITERIA

The following criteria need to be considered prior to making a decision on how to handle and dispose waste:

1. Examine the possibility of returning waste to its original location and matrix with no cross-contamination between matrices or affecting other on-site locations. (For example, soil cuttings generated from a deep borehole could be placed back to the hole after sampling and still be protective of human health and the environment.)
2. Determine if land disposal restrictions (LDRs) are applicable to IDW management. In order to do this evaluation the following three questions need to be answered:
 - A. Is the IDW a RCRA hazardous waste?
 - B. Is the RCRA hazardous waste regulated under the LDRs?
 - C. Does the anticipated approach to IDW management constitute "placement" (land disposal) of the generated waste?

LDRs apply if the answer to all three questions is yes. The most frequently asked question is whether placement or land disposal of IDW occurred as a result of removing waste from its source, moving waste within the area of contamination, and finally returning it to its source. Ohio EPA's response to this question is, as explained in the definition section under placement, that IDW replaced to its source does not constitute "placement".

3. Evaluate whether the wastes pose an immediate threat to human health and the environment. If they do, wastes need to be removed, containerized, and disposed off-site to a permitted treatment storage and disposal facility (TSDF).
4. Evaluate storage and disposal options of waste. If the selected management option will result in generation of waste piles, wastes need to be containerized in drums, tanks, etc., stored either on-site or off-site and finally be managed off-site. There may be situations, however, where waste could be managed on site if the final remedy is implemented within the time frame specified by the statutes.
5. Evaluate and select storage and disposal actions that comply with applicable regulations.
6. Select IDW management options that are consistent with the final remedy.
7. On-site storage of IDW requires the consent of the site owner allowing the containerized IDW to be temporarily stored on-site while awaiting pickup for off-site disposal. If the site owner disagrees with on-site storage of waste, the waste needs to be managed in a designated off-site location.

3. **WASTES THAT CAN BE DISPOSED ON-SITE WITH NO NEED FOR ANALYTICAL TESTING AND COMPLIANCE WITH REGULATIONS**

Wastes that satisfy the first criterion of the criteria policy section can be disposed on-site with no need for analytical testing and compliance with regulations. Typically, these wastes are soil cuttings generated after sampling of a soil matrix or liquid/semi-liquid samples from lagoons, ponds, streams, etc. Also purged water that was stored on site, analyzed, and tested clean for substances and concentrations under the statutes may be poured anywhere on-site.

4. WASTES THAT WILL HAVE TO BE CONTAINERIZED, ANALYZED AND DISPOSED

Wastes that can not satisfy the first criteria of the criteria policy section will have to be containerized, analyzed and disposed. Typically, these wastes are purged water, soil cuttings and/or mud, mud from construction of wells, PPE and disposable sampling equipment, residues from testing of treatment technologies, decon fluids, etc.

PROCEDURE

1. WASTE CATEGORY: Soil Cuttings

Process of Generation and Response Action:

2. During the course of surface soil investigations, investigation derived waste may be generated. This process is not expected to generate any IDW, but if it does, all IDW should return to its source immediately after generation.
3. Waste generated during subsurface soil investigations:
 - A. IDW generated using an auger or a similar device to collect subsurface samples. After obtaining the desired sample, waste should be put back to its source. However, since there is a potential of not having enough material to fill up the borehole, the borehole should be filled with bentonite clay to the surface level. If the soil was tightly compacted and excess material is left over after filling the borehole, then the investigators should select one of the following options:
 1. Examine the possibility of re-compacting the soil so it can accommodate the excess soil.
 2. If previous findings or field conditions indicate that IDW is solid waste or clean material, IDW could be spread around the sampling location as long as waste piles are not being generated.
 3. If both of the above options are not applicable, containerize all excess soil cuttings, collect, and analyze a composite sample.
 - B. IDW generated during installation of monitoring wells will be managed as follows:
 1. If material tested clean (non-hazardous), it will be graded over the site surface soils at the conclusion of investigations.
 2. Depending on the volume of waste and location of wells (close

proximity and same zone of contamination), wastes could be segregated, containerized, and composite samples collected and analyzed.

3. Residual test waste generated from evaluation of treatment technologies either at the Feasibility or Remedial Design Phase. IDW could be generated during pilot test studies and trial runs. Samples are collected to evaluate the treatment efficiency and analyze constituents of waste. Treated waste will be stored and response actions could follow one of the following three choices:
 1. Remove contaminated waste within the storage time frame required by regulations.
 2. If remedial action will be implemented on-site within specified IDW storage time, and the remedy is consistent with the disposal option of the IDW, the waste should be stored and disposed on-site.
 3. Waste that tested clean should be used as fill material on-site.

Container and Labeling Requirements:

Small volumes of waste should be containerized in 55 gallon drums. Large volumes of waste should be containerized in roll-off boxes, baker tanks, poly tanks, bins or some other container deemed by Ohio EPA as an appropriate storage container. An estimate on the number of containers needed for the collection of IDW should be made before the investigation begins. The containers must be made of or lined with material which will not react and is otherwise compatible with the hazardous waste to be stored, so that the ability of the containers to contain the waste is not impaired.

All drums and tanks will be marked with the start generation date and a drum number specific to each container assigned by the person in charge of the IDW inventory. Also, a drum log will be maintained on-site which tracks the drum numbers, the start generation date, and the storage time requirements. If material is analyzed and determined to be waste, the container should indicate the type of stored waste. Regulations that deal with containerization and labeling requirements of waste can be found in the chapters of the Ohio Administrative Code (OAC) 3745-52-34

Storage Requirements:

A temporary storage facility is required for containers storing IDW and only authorized personnel or officials should have access to it. Waste could be stored either on-site or off-site. In either case, the facility should be completely enclosed so that its contents are not visible to passers-by and to prevent precipitation collection, run on, or infiltration from occurring. Consideration should be

given to minimizing the possibility of fire, explosion, or any unplanned release of hazardous waste to the environment (i.e. ignitable or reactive wastes should be stored in containers/tanks that provide protection from containers that may cause them to ignite or react). If such a facility does not exist on-site, a temporary facility could be constructed after reaching an agreement with the site owner regarding the location and size of facility. Regulations that deal with storage requirements of waste can be found in Ohio Administrative Code (OAC) 3745-5234

Sampling and Analytical Testing:

One composite sample should be collected from each large container or group of drums. Small samples should be collected from several locations and depths of the handling containers, homogenized in a decontaminated bucket, and placed in sampling jars. Since there is a concern of mixing wastes and possibly diluting wastes, Ohio EPA suggests that serious thought should be given in segregating the waste. Based on preliminary information, the investigation team should combine samples that are coming from the same area of contamination and close proximity of sampling locations in the same container.

Instead of combining IDWs and analyzing composite samples, the team has the alternative option of separately containerizing IDW from its distinct location and deciding on the proper management disposal option based on analysis from the real sample collected for the purpose of the investigation.

Samples will be analyzed using SW-846 methods, 8240/8260 for volatile compounds, 8270 for semi-volatile compounds, 8080 for PCBs and pesticides, 6010 for metals, 7740 for selenium, 7421 for lead, 7470 for mercury, and 7060 for arsenic.

Regulations that deal with sampling and analytical testing requirements of waste can be found in Ohio Administrative Code (OAC) 3745-51-20, Appendices I and II.

Off-site Disposal of Waste:

Following containerization and analysis, any waste found to be hazardous, polychlorinated biphenyl, or radioactive waste must be disposed of following the appropriate regulatory procedures. The investigation team should obtain a generator ID from DHWM (OAC 3745-51-12), select a subcontractor for pickup and disposal of waste, and finally select the treatment, storage and disposal facility. The facility's compliance with state and federal regulations should be verified before sending any IDW. Containerized and tested RCRA hazardous IDW must be accompanied by a Hazardous Waste Manifest. Regulations that deal with generator's responsibilities regarding transportation requirements of waste can be found in

Ohio Administrative Code (ORC) 3745-52-30 to 3745-52-33

On-site Disposal of Waste

IDW disposed on-site should comply with the above recommended response actions. If IDW is hazardous waste and placement of waste occurred that triggered LDRs, then compliance with OAC Chapter 3745-59 is required.

2. WASTE CATEGORY: DRILLING MUD

Process of Generation and Response Action

1. Certain drilling well construction processes require the use of drilling fluids, both to cool the drill bit and remove the cuttings. The drilling mud resulting from this process will be comprised of the drilling fluid used (usually water) and the soil make up (clay, sand, rock, etc.) as well as any existing contaminants. The produced mud/slurry can not be returned to its source since the displaced volume of drilling mud has been replaced with the casing and grout material. The following response actions are available and must be evaluated by the investigators:

1. Containerize the waste if there is a fact or suspicion that contaminants may be present. In most sites under investigation, this is the preferred and recommended approach.
2. Consider distributing and grading the mud/slurry around the well site if it is believed that the material is contaminant free.
3. If there is no information from previous site assessments, the waste must be bulked in 55 gallon drums and analyzed. If the waste is non-hazardous, it will be graded over the site-surface soils at the conclusion of the investigation.

If the waste is hazardous, the waste needs to be taken off-site within the specified time frame allowed by the regulations (OAC Chapter 3745-52).

Container and labeling requirements, storage requirements, sampling/analytical testing, and disposal methods would be the same as those for "Soil Cuttings".

3. WELL DEVELOPMENT AND PURGE WATER

Process of Generation and Response Action

A certain amount of IDW is expected to be generated during ground water investigations (ground water samples will be collected in accordance with Ohio EPA's guidance "Technical Guidance Manual for Hydrogeologic Investigations and Ground Water Monitoring Programs").

The following two processes are commonly encountered:

1. Newly constructed wells will need to be "developed", requiring water from the new well to be pumped until a turbid-free sample can be collected and submitted for analysis. The amount of "well development water" collected will vary depending on the amount of clay, silt, sand, etc. that must be removed before a sediment-free sample can be collected.
2. In the case of an existing well, stagnant water must be removed before a "true" sample of ground water can be collected for analysis. There are several opinions regarding the amount of water that should be purged and methods used to determine that amount, but generally a minimum of three times the well's static volume is removed.

Waste generated during well development and purging will be containerized and depending on the analytical results, will be managed as follows:

- A. If waste is determined to be non-hazardous, it may be:
 1. disposed via on-site sewer drain (with permission of local authority);
 2. poured on the ground within the site's boundaries after the site owner has received notification and agreed with the disposal method. Before implementing this option, consideration should be given to the presence of any contaminants in the soil and whether pouring the waste water on the soil will mobilize any contaminants to the ground water; or
 3. depending on quality and quantity of waste water, transported to the nearest Public Owned Treatment Works (POTW) with capabilities of handling it. If there is no POTW available in the area, arrangements can be made with another POTW that can handle the load.
- B. If waste is determined to be hazardous, it should remain containerized and will either require off-site disposal to a permitted TSD facility or disposal at the site's Treatment and Disposal Unit (TDU).

Container and labeling requirements, storage requirements, sampling/analytical testing methods, off-site and on-site disposal would be the same as those for "Soil Cuttings".

4. WASTE CATEGORY: SEDIMENT

Process of Generation and Response Action

1. A minimal amount of IDW is expected to be generated during the sediment sample collections and would consist of small quantities of excess sediment removed from source during the collection procedure. Three types of sample collection equipment are commonly used for collecting environmental sediment samples:
 1. stainless steel spoon";
 2. dredge, used from a boat if sampling from lagoon, ponds; or
 3. corer

The recommended response action is returning any excess sediment to the source immediately after the collection of a sample. This action is not expected to change the conditions at the site and is practicable to reduce the storage and disposal costs associated with such a small volume of waste. If large quantities of waste are anticipated to result from sediment investigations, (meaning close to 55 gallon per area of contaminations), it is expected that the waste will be containerized, stored, analyzed and disposed as discussed in the section of "Soil Cuttings".

5. WASTE CATEGORY: SLUDGE

Process of Generation and Response Action

Processes and procedures followed for management of IDW generated during the sediment sample collection would be applicable to this waste category.

6. WASTE CATEGORY: DECONTAMINATION FLUIDS

Process of Generation and Response Action

1. Sampling equipment, heavy equipment, non-disposable protective equipment used in the "exclusion zone" and in the decontamination line will all require decontamination.
 - a.. Several containers (children's wading pools, large galvanized tubs) will be utilized for the collection of washing and rinsing solutions generated during the decontamination of apparel and items from the "hot" zone. These fluids should be collected daily and deposited into a 55-gallon Department of Transportation (DOT) approved drum located at the end of the decon line.

- b. Cleaning fluids from heavy equipment decontamination should be collected at decontamination pads and transferred to 55-gallon DOT approved drums.

IDW generated during this process may be managed as follows:

- A. If waste is determined to be non-hazardous, it may be
 - 1. disposed via on-site sewer drain (with permission of local authority);
 - 2. stored in appropriate containers for future treatment and/or disposal; or
 - 3. depending on quality and quantity of IDW, transported to nearest POTW with capabilities of handling it. (i.e. if the IDW has an aqueous layer and a non-aqueous layer, it must be determined if the POTW will accept the aqueous and non-aqueous layers. If the POTW will accept only the aqueous layer, the non-aqueous layer must be collected for disposal.)
- B. If waste is determined to be hazardous, it should remain containerized and will require off-site disposal.

Container and Labeling Requirements:

Small volumes of waste should be containerized in 55 gallon drums. A 550 gallon tank could be used for bulk collection of all decontamination fluid drums. Since most containers of decon fluids will require off-site disposal, the appropriate DOT approved containers should be used for the collection of this waste. The labeling of the containers should be in compliance with ORC 3745-52-34.

Storage requirements, off-site and on-site disposal would be the same as those for "Soil Cuttings".

7. WASTE CATEGORY: PERSONAL PROTECTIVE EQUIPMENT AND DISPOSABLE EQUIPMENT

Process of Generation and Response Action

PPE and DE used by personnel during site investigation and decontamination procedures can become contaminated in a variety of ways:

- a. contact with vapors, mists, gases or particulates in the air;
- b. materials being splashed during sample collection, while opening containers, or during decontamination process;
- c. walking through puddles of liquid contaminants;
- d. Sitting/kneeling on contaminated soil; and/or
- e. using or cleaning contaminated instruments or equipment.

Personnel wearing the PPE will generally have to participate in one of four possible decontamination processes:

- a. physical removal of contaminants;
- b. inactivation of contaminants by chemical detoxification or disinfection/sterilization;
- c. a combination of physical and chemical processes; or
- d. if decontamination is not possible, collect items, place in appropriate container, and label for disposal.

The PPE should be characterized for disposal based on knowledge of hazardous substances encountered during the investigative and decontamination process:

1. In some instances, it is possible to decontaminate all PPE, thereby changing its classification from hazardous to non-hazardous. For instance, certain types of contaminated soil or dust can be physically removed with a wash and rinse. When this is the case, PPE could be double bagged and deposited in an industrial dumpster or a sanitary landfill.
2. If decontamination is not possible, the equipment will need to be double bagged, collected in 55-gallon drums, and disposed of following the appropriate regulatory procedure for the type of contaminants involved.

The DE should be double-bagged and deposited either in an industrial or in a sanitary landfill. If DE are grossly contaminated, the equipment need to be characterized for disposal as described above for the PPE waste category.

Storage requirements will be the same as those for "Soil Cuttings"