SECTION VII ENVIRONMENTAL

Standards and Specifications

Prepared by:
Community Development Department

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MAPS

Section 1.01 DISCIPLINES OF A QUALIFIED ENVIRONMENTAL PROFESSIONAL

The purpose of this section is to detail evaluation procedures and supporting criteria for a qualified environmental professional (QEP) designation per the *City of Palm Coast Unified Land Development Code (LDC)*. The following disciplines will be assessed by the City's Community Development Director (CDD) to determine if the applicant's experience and knowledge is sufficient regarding central Florida environmental assessments.

Section 1.02 APPLICATION REVIEW

For the purpose of this section, an "applicant" will identify a professional (Principal or Project Manager) seeking a QEP designation from the CDD. In essence, the applicant will be evaluated based on individual experience, qualifications, and resources. Achieving a QEP designation is appropriate for professionals who will "sign-off" on environmental assessments.

Each applicant seeking a QEP designation shall submit an evaluation package including a City application form and supporting documentation to the CDD. It is the goal to evaluate all package(s) in a timely manner within required timeframes. Upon receipt of the application, the CDD will have thirty (30) days from time of stamped receipt to evaluate and determine the submittal complete. In the event that additional information is required, the CDD will request sufficiency materials to properly evaluate the application. The applicant has 120 days from the correspondence date to respond with the requested information. Upon the receipt of the applicant's response, all submittal materials will be evaluated and a designation determination released within ninety (90) days of stamped receipt.

During this review time, an applicant may submit assessments as part of project review applications. In the event that the applicant does not receive a QEP determination within the duration of staff project review, the CDD reserves the authority to require a separate evaluation from an existing QEP in order to avoid delaying project review.

Section 1.03 EXEMPTIONS

If a professional entity holds a City of Palm Coast continuing services contract evaluated on criteria detailed herein, an executed work order will serve as sufficient documentation to receive a QEP designation. However, this does not exempt the applicant from designation maintenance and renewal requirements.

Section 1.04 EVALUATION CRITERIA

A. The applicant will be evaluated based on two (2) fields of expertise:

1. Wetland resources
2. Listed species

B. If determined to be QEP eligible, the applicant will receive a QEP designation with a focus in wetland resources, listed species, or both. These disciplines are detailed in the following sections with individual criteria requirements:

1. Wetland Resources (**Section 10.01**, *LDC*) -

a. Description and copies of degrees, certifications, and/or licenses with associated expirations, if applicable.

b. Wetland delineation and Mapping: Provide a project summary detailing a minimum of five (5) completed projects. Details must include utilized determination methodologies and product samples.

c. Quantitative wetland function analysis: Provide Uniform Mitigation Assessment Method (UMAM) assessments and/or Wetland Rapid Assessment Methodology (WRAP) with supporting forms, figures, and other relevant materials. A minimum of one (1) example from each methodology is required.

d Mitigation planning and design: Provide a project summary detailing a minimum of three (3) completed projects. Details must include target ecosystem, mitigation plan, execution, and verification of success requirement satisfaction. Mitigation may include, but not limited to, wetland enhancement, creation, preservation, banking, and treatment facilities.

2. Listed Species (**Section 10.04**, *LDC*) -

a. Description and copies of degrees, certifications, and/or licenses with associated expirations, if applicable.

b. Habitat identification and Mapping: Provide a project summary detailing a minimum of five (5) completed projects. Details must include utilized determination methodologies and product samples.

c. Comprehensive flora and fauna surveys: Provide two (2) samples of survey assessment reports.

d. Listed species-specific surveys: Provide two (2) samples of survey assessment reports.

e. Listed species permitting and management: Provide a project summary detailing two (2) completed projects involving listed species. Details must include utilized determination methodologies and product samples.

Section 1.05 DESIGNATION MAINTENANCE

In order to maintain qualified professionals operating within the City of Palm Coast, QEP designees will be required to provide subsequent updates to receiving initial approval. Due to rapidly advancing technologies and regulations, QEP must supply the CDD every two (2) years an update of previous submittal information (i.e. licenses, continuing education, abilities, etc.). In the event that the CDD does not receive an update thirty (30) days subsequent to the anniversary date, the designation will expire and the applicant will be required to resubmit a full application for consideration.

Section 1.06 PUBLIC RECORD

The City of Palm Coast maintains records of all applicants and qualified environmental professionals (QEP). This information is readily available to the pubic and will be provided upon request. In addition, the City reserves the right to provide the record via internet resources or other mediums if public requests become overwhelming.

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Section 2.01 DETERMINATION OF APPROVAL TYPE - OVERVIEW

To determine the type of approval needed from the City of Palm Coast, an assessment of the functions provided by wetlands and associated upland buffer located within a project boundary is required. The assessment of current condition evaluates the following: location and landscape support; water environment; and community structure.

A. The Wetland Quality Assessment Methodology (WQAM) is designed to be used for all regulated wetlands in the City. The assessment shall be completed by a qualified environmental professional (QEP). The inherent flexibility required for such a method is accomplished in a multipart approach that consists of the following processes:

1. Conduct qualitative characterization of the assessment area (**Part 1**) that identifies the functions provided by the area to fish and wildlife and their habitat and establishes a framework for quantitative assessment.
2. Conduct quantitative assessment (**Part 2**) of the sites and use the numerical scores to determine the level of review, restrictions, and type of approach required from the City of Palm Coast.

B. **Part 1** of this method provides a descriptive framework to characterize the assessment area and the functions provided by that area. **Part 2** of this method provides indicators of wetland and other surface water functions that are to be scored based on the framework developed in **Part 1**. **Part 1** must be completed and referenced by the user of this method when scoring the assessment area in **Part 2**. A project site may contain more than one assessment area, each of which shall be independently evaluated under this method.

Section 2.02 QUALITATIVE CHARACTERIZATION – PART 1

An assessment area must be described with sufficient detail to provide a frame of reference for the type of community being evaluated and to identify the functions that will be evaluated. Information for each assessment area must be sufficient to identify the functions beneficial to fish and wildlife and their habitat that are characteristic of the assessment area, based on currently available information, such as aerial photographs, topographic maps, geographic information system data and maps, site visits, scientific articles, journals, applicable professional reports, field verification when needed, and reasonable scientific judgment. The information provided by the applicant for each assessment area must address the following, as applicable:

A. Special water classifications, such as whether the area is in an Outstanding Florida Water, an Aquatic Preserve, a Class II waters approved, restricted, conditionally approved, conditionally restricted for shellfish harvesting, or an Area of Critical State Concern;

B. Significant nearby features that might affect the values of the functions provided by the assessment area, such as areas with regionally significant ecological resources or habitats (national or state parks, forests, or reserves; Outstanding National Resource Waters and associated watershed; Outstanding Florida Waters and associated watershed; other conservation areas), major industry, or commercial airport;

C. Assessment area size;

D. Geographic relationship and hydrologic connection between the assessment area and any contiguous wetland or other surface waters, or uplands, as applicable;

E. Classification of assessment area, including description of past alterations that affect the classification. Classification shall be based on *Florida Land Use, Cover and Form Classification System* (1999) (*FLUCFCS*) codes, which is incorporated by reference herein. In addition, the applicant may further classify the assessment area using the 26 *Communities of Florida, Soils Conservation Service* (February 1981), which is incorporated by reference herein; A Hydrogeomorphic Classification for Wetlands, Wetland Research Program Technical Report WRP-DE-4, Mark M. Brinson (August 1993), which is incorporated by reference herein; or other sources that, based on reasonable scientific judgment, describe the natural communities in Florida;

F. Uniqueness when considering the relative rarity of the wetland or other surface water and floral and faunal components, including listed species, on the assessment area in relation to the surrounding regional landscape;

G. Functions performed by the assessment area. Functions to be considered are: providing cover, substrate, and refuge; breeding, nesting, denning, and nursery areas; corridors for wildlife movement; food chain support; and natural water storage, natural flow attenuation, and water quality improvement, which enhances fish, wildlife, and listed species utilization;

H. Anticipated wildlife utilization and type of use (feeding, breeding, nesting, resting, or denning), and applicable listing classifications [threatened, endangered, or species of special concern as defined by Sections 68A-27.003, 68A-27.004, and 68A-27.005, *Florida Administrative Code (FAC)]*. The list developed for the assessment area need not include all species that use the area, but must include all listed species in addition to those species that are characteristic of the area and the functions provided by the area, considering the size and location of the assessment area. Generally, wildlife surveys will not be required. The need for a wildlife survey will be determined by the likelihood that the site is used by listed species, considering site characteristics and the range and habitat needs of such species, and whether the proposed system will impact that use;

I. Whether any portion of the assessment area has been previously used as mitigation for other projects; and

J. Any additional information needed to accurately characterize the ecological values of the assessment area and functions provided.

PART 1 – Qualitative Description
Wetland Quality Assessment Method

Site/Project Name	Application Number	Assessment Area Name or Number

FLUCCs code	Further classification (optional)	Impact or Mitigation Site?	Assessment Area Size

Basin/Watershed Name/Number	Affected Waterbody (Class)	Special Classification (i.e.OFW, AP, other local/state/federal designation of importance)

Geographic relationship to and hydrologic connection with wetlands, other surface water, uplands

Assessment area description

Significant nearby features	Uniqueness (considering the relative rarity in relation to the regional landscape)

Functions	Mitigation for previous permit/other historic use

Anticipated Wildlife Utilization Based on Literature Review (List of species that are representative of the assessment area and reasonably expected to be found) Anticipated Utilization by Listed Species (List species, their legal classification (E, T, SSC), type of use, and intensity of use of the assessment area)
Observed Evidence of Wildlife Utilization (List species directly observed, or other signs such as tracks, droppings, casings, nests, etc.):
Additional relevant factors:

Assessment conducted by:	Assessment date(s):

Part 1 – Qualitative Description
Wetland Quality Assessment Method
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Section 2.03 ASSESSMENT AND SCORING – PART 2

Utilizing the frame of reference established in **Part 1,** the information obtained under this part must be used to determine the degree to which the assessment area provides the functions identified in **Part 1**.

A. Current condition for assessment areas where previous impacts that affect the current condition are temporary in nature, consideration will be given to the inherent functions of these areas relative to seasonal hydrologic changes, and expected vegetation regeneration and projected habitat functions if the use of the area were to remain unchanged. Previous construction or alteration undertaken in violation of Part IV, Chapter 373, *Florida Statutes (FS)*, or Sections 403.91-.929, *FS* (1984 Supp.), as amended, or rule, order, or permit adopted or issued thereunder by federal, state, or the City, will not be considered as having diminished the condition and relative value of a wetland or surface water, when assigning a score under this part. When evaluating wetlands or other surface waters that are within an area that is subject to a recovery strategy pursuant to Rule 40D-80, *FAC*, impacts from water withdrawals will not be considered when assigning a score under this part.

1. The evaluation must be based on currently available information, such as aerial photographs, topographic maps, geographic information system data and maps, site visits, scientific articles, journals, other professional reports, and reasonable scientific judgment.

2. Indicators of wetland and other surface water function listed in this part are scored on a relative scale of zero (0) to ten (10), based on the level of function that benefits fish and wildlife. For the purpose of providing guidance, descriptions are given for four general categories of scores: optimal (10), moderate (7), minimal (4), and not present (0). Any whole number score between 0 – 10 may be used that is a best fit to a single or combination of descriptions and in relation to the optimal level of function of that community type or habitat.

3. Three (3) categories of indicators of wetland function (location and landscape support, water environment and community structure) described in subsections **2.03.01** through **2.03.04** of this manual are to be scored to the extent that they affect the ecological value of the assessment area.

2.03.01 LOCATION AND LANDSCAPE SUPPORT

The value of functions provided by an assessment area to fish and wildlife are influenced by the landscape position of the assessment area and its relationship with surrounding areas. Many species that nest, feed, or find cover in a specific habitat or habitat type are also dependent in varying degrees upon other habitats, including upland, wetland and other surface waters, that are present in the regional landscape. For example, many amphibian species require small isolated wetlands for breeding pools and for juvenile life stages, but may spend the remainder of their adult lives in uplands or other wetland habitats. If these habitats are unavailable or poorly connected in the landscape or are degraded, then the value of functions provided by the assessment area to the fish and wildlife identified in **Part 1** is reduced. The location of the assessment area shall be considered to the extent that fish and wildlife utilizing the area have the opportunity to access other habitats necessary to fulfill their life history requirements. The availability, connectivity, and quality of offsite habitats, and offsite land uses that might adversely impact fish and wildlife utilizing these habitats, are factors to be considered in assessing the location of the assessment area. The location of the assessment area shall be considered relative to offsite and upstream hydrologic contributing areas and to downstream and other connected waters to the extent that the diversity and

abundance of fish and wildlife and their habitats is affected in these areas. The opportunity for the assessment area to provide off site water quantity and quality benefits to fish and wildlife and their habitats downstream and in connected waters is assessed based on the degree of hydrologic connectivity between these habitats and the extent to which offsite habitats are affected by discharges from the assessment area. It is recognized that isolated wetlands lack surface water connections to downstream waters and as a result, do not perform certain functions (e.g., detrital transport) to benefit downstream fish and wildlife; for such wetlands, this consideration does not apply.

A. A score of (10) means the assessment area is ideally located and the surrounding landscape provides full opportunity for the assessment area to perform beneficial functions at an optimal level. The score is based on reasonable scientific judgment and characterized by a predominance of the following, as applicable:

1. Habitats outside the assessment area represent the full range of habitats needed to fulfill the life history requirements of all wildlife listed in **Part 1** and are available in sufficient quantity to provide optimal support for these wildlife.
2. Invasive exotic or other invasive plant species are not present in the proximity of the assessment area.
3. Wildlife access to and from habitats outside the assessment area is not limited by distance to these habitats and is unobstructed by landscape barriers.
4. Functions of the assessment area that benefit downstream fish and wildlife are not limited by distance or barriers that reduce the opportunity for the assessment area to provide these benefits.
5. Land uses outside the assessment area have no adverse impacts on wildlife in the assessment area as listed in **Part 1**.
6. The opportunity for the assessment area to provide benefits to downstream or other hydrologically connected areas is not limited by hydrologic impediments or flow restrictions.
7. Downstream or other hydrologically connected habitats are critically or solely dependent on discharges from the assessment area and could suffer severe adverse impacts if the quality or quantity of these discharges were altered.

B. A score of (7) means that, compared to the ideal location, the location of the assessment area limits its opportunity to perform beneficial functions to seventy percent (70%) of the optimal ecological value. The score is based on reasonable scientific judgment and characterized by a predominance of the following, as applicable:

1. Habitats outside the assessment area are available in sufficient quantity and variety to provide optimal support for most, but not all, of the wildlife listed in **Part 1**, or certain wildlife populations may be limited due to the reduced availability of habitats needed to fulfill their life history requirements.
2. Some of the plant community composition in the proximity of the assessment area consists of invasive exotic or other invasive plant species, but cover is minimal and has minimal adverse effect on the functions provided by the assessment area.
3. Wildlife access to and from habitats outside the assessment area is partially limited, either by distance or by the presence of barriers that impede wildlife movement.
4. Functions of the assessment area that benefit fish and wildlife downstream are somewhat limited by distance or barriers that reduce the opportunity for the assessment area to provide these benefits.
5. Land uses outside the assessment area have minimal adverse impacts on fish and wildlife identified in **Part 1**.

6. The opportunity for the assessment area to provide benefits to downstream or other hydrologically connected areas is limited by hydrologic impediments or flow restrictions such that these benefits are provided with lesser frequency or lesser magnitude than would occur under optimal conditions.
7. Downstream or other hydrologically connected habitats derive significant benefits from discharges from the assessment area and could suffer substantial adverse impacts if the quality or quantity of these discharges were altered.

C. A score of (4) means that, compared to the ideal location, the assessment area location limits its opportunity to perform beneficial functions to forty percent (40%) of the optimal ecological value. The score is based on reasonable scientific judgment and characterized by a predominance of the following, as applicable:

1. Availability of habitats outside the assessment area is fair, but fails to provide support for some species of wildlife listed in **Part 1**, or provides minimal support for many of the species listed in **Part 1**.
2. The majority of the plant community composition in the proximity of the assessment area consists of invasive exotic or other invasive plant species that adversely affect the functions provided by the assessment area.
3. Wildlife access to and from habitats outside the assessment area is substantially limited, either by distance or by the presence of barriers which impede wildlife movement.
4. Functions of the assessment area that benefit fish and wildlife downstream are limited by distance or barriers that substantially reduce the opportunity for the assessment area to provide these benefits.
5. Land uses outside the assessment area have significant adverse impacts on fish and wildlife identified in **Part 1**.
6. The opportunity for the assessment area to provide benefits to downstream or other hydrologically connected areas is limited by hydrologic impediments or flow restrictions, such that these benefits are rarely provided or are provided at greatly reduced levels compared to optimal conditions.
7. Downstream or other hydrologically connected habitats derive minimal benefits from discharges from the assessment area but could be adversely impacted if the quality or quantity of these discharges were altered.

D. A score of (0) means that the location of the assessment area provides no habitat support for wildlife utilizing the assessment area and no opportunity for the assessment area to provide benefits to fish and wildlife outside the assessment area. The score is based on reasonable scientific judgment and characterized by a predominance of the following, as applicable:

1. No habitats are available outside the assessment area to provide any support for the species of wildlife listed in **Part 1**.
2. The plant community composition in the proximity of the assessment area consists predominantly of invasive exotic or other invasive plant species such that little or no function is provided by the assessment area.
3. Wildlife access to and from habitats outside the assessment area is precluded by barriers or distance.
4. Functions of the assessment area that would be expected to benefit fish and wildlife downstream are not present.
5. Land uses outside the assessment area have a severe adverse impact on wildlife in the assessment area as listed in **Part 1**.

6. There is negligible or no opportunity for the assessment area to provide benefits to downstream or other hydrologically connected areas due to hydrologic impediments or flow restrictions that preclude provision of these benefits.
7. Discharges from the assessment area provide negligible or no benefits to downstream or hydrologically connected areas and these areas would likely be unaffected if the quantity or quality of these discharges were altered.

2.03.02 WATER ENVIRONMENT

The quantity of water in an assessment area, including the timing, frequency, depth and duration of inundation or saturation, flow characteristics, and the quality of that water, may facilitate or preclude its ability to perform certain functions and may benefit or adversely impact its capacity to support certain wildlife. Hydrologic requirements and tolerance to hydrologic alterations and water quality variations vary by ecosystem type and the wildlife utilizing the ecosystem. Hydrologic conditions within an assessment area, including water quantity and quality, must be evaluated to determine the effect of these conditions on the functions performed by area and the extent to which these conditions benefit or adversely affect wildlife. Water quality within wetlands and other surface waters is affected by inputs from surrounding and upstream areas and the ability of the wetland or surface water system to assimilate those inputs. Water quality within the assessment area can be directly observed or can be inferred based on available water quality data, on-site indicators, adjacent land uses, and estimated pollutant removal efficiencies of contributing surface water management systems. Hydrologic conditions in the assessment area are a result of external hydrologic inputs and the water storage and discharge characteristics of the assessment area. Landscape features outside the assessment area, such as impervious surfaces, borrow pits, levees, berms, swales, ditches, canals, culverts, or control structures, may affect hydrologic conditions in the assessment area. Surrounding land uses may also affect hydrologic conditions in the assessment area if these land uses increase discharges to the assessment area, such as agricultural discharges of irrigation water, or decrease discharges, such as wellfields or mined areas.

A. A score of (10) means that the hydrology and water quality fully supports the functions and provides benefits to fish and wildlife at optimal capacity for the assessment area. The score is based on reasonable scientific judgment and characterized by a predominance of the following, as applicable:

1. Water levels and flows appear appropriate, considering seasonal variation, tidal cycle, antecedent weather and other climatic effects.
2. Water level indicators are distinct and consistent with expected hydrologic conditions for the type of system being evaluated.
3. Soil moisture is appropriate for the type of system being evaluated, considering seasonal variation, tidal cycle, antecedent weather and other climatic effects. No evidence of soil desiccation, oxidation or subsidence is observed.
4. Soil erosion or deposition patterns are not atypical or indicative of altered flow rates or points of discharge.
5. Evidence of fire history does not indicate atypical fire frequency or severity due to excessive dryness.
6. Vegetation or benthic community zonation in all strata are appropriate for the type of system being evaluated and does not indicate atypical hydrologic conditions.

7. Vegetation shows no signs of hydrologic stress such as excessive mortality, leaning or fallen trees, thinning canopy or signs of insect damage or disease that may be associated with hydrologic stress.
8. Presence or evidence of use by animal species with specific hydrologic requirements is consistent with expected hydrologic conditions for the system being evaluated.
9. Plant community composition is not characterized by species tolerant of and associated with water quality degradation or alterations in frequency, depth, and duration in inundation or saturation.
10. Direct observation of standing water indicates no water quality degradation such as discoloration, turbidity, or oil sheen.
11. Existing water quality data indicates conditions are optimal for the type of community and would fully support the ecological values of the area.
12. Water depth, wave energy, currents and light penetration are optimal for the type of community being evaluated.

B. A score of (7) means that the hydrology and water quality supports the functions and provides benefits to fish and wildlife at seventy percent (70% of the optimal capacity for the assessment area.

The score is based on reasonable scientific judgment and characterized by a predominance of the following, as applicable:

1. Water levels and flows are slightly higher or lower than appropriate, considering seasonal variation, tidal cycle, antecedent weather and other climatic effects.
2. Water level indicators are not as distinct or as consistent as expected for hydrologic conditions for the type of system being evaluated.
3. Although soil oxidation or subsidence is minimal, soils are drier than expected for the type of system being evaluated, considering seasonal variation, tidal cycle, antecedent weather and other climatic effects.
4. Soil erosion or deposition patterns indicate minor alterations in flow rates or points of discharge.
5. Fire history evidence indicates that fire frequency or severity may be more than expected for the type of system being evaluated, possibly due to dryness.
6. Vegetation or benthic community zonation in some strata is inappropriate for the type of system being evaluated, indicating atypical hydrologic conditions.
7. Vegetation has slightly greater than normal mortality, leaning or fallen trees, thinning canopy, or signs of insect damage or disease which may be associated with some hydrologic stress.
8. Presence or evidence of use by animal species with specific hydrologic requirements is less than expected or species present have more generalized hydrologic requirements.
9. Some of the plant community composition consists of species tolerant of and associated with moderate water quality degradation or alterations in frequency, depth, and duration in inundation or saturation.
10. Direct observation of standing water indicates slight water quality degradation such as discoloration, turbidity, or oil sheen.
11. Existing water quality data indicates slight deviation from what is normal, but these variations in parameters, such as salinity or nutrient loading, are not expected to cause more than minimal ecological effects.

12. Water depth, wave energy, currents and light penetration are generally sufficient for the type of community being evaluated but are expected to cause some changes in species, age classes and densities.

C. A score of (4) means that the hydrology and water quality supports the functions and provides benefits to fish and wildlife at forty percent (40%) of the optimal capacity for the assessment area. The score is based on reasonable scientific judgment and characterized by a predominance of the following, as applicable:

1. Water levels and flows are moderately higher or lower than appropriate, considering seasonal variation, tidal cycle, antecedent weather and other climatic effects.

2. Water level indicators are not distinct and are not consistent with the expected hydrologic conditions for the type of system being evaluated.

3. Soil moisture has deviated from what is appropriate for the type of system being evaluated, considering seasonal variation, tidal cycle, antecedent weather and other climatic effects. Strong evidence of soil desiccation, oxidation or subsidence is observed.

4. Soil erosion or deposition patterns are strongly atypical and indicative of alterations in flow rates or points of discharge.

5. Fire history evidence indicates that fire frequency or severity may be much more than expected for the type of system being evaluated, possibly due to dryness.

6. Vegetation or benthic community zonation in most strata is inappropriate for the type of system being evaluated, indicating atypical hydrologic conditions.

7. Vegetation has strong evidence of greater than normal mortality, leaning or fallen trees, thinning canopy or signs of insect damage or disease associated with hydrologic stress.

8. Presence or evidence of use by animal species with specific hydrologic requirements is greatly reduced from expected or those species present have more generalized hydrologic requirements.

9. Much of the plant community composition consists of species tolerant of and associated with moderate water quality degradation or alterations in frequency, depth, and duration in inundation or saturation.

10. Direct observation of standing water indicates moderate water quality degradation such as discoloration, turbidity, or oil sheen.

11. Existing water quality data indicates moderate deviation from normal for parameters such as salinity or nutrient loading, so that ecological effects would be expected.

12. Water depth, wave energy, currents and light penetration are not well suited for the type of community being evaluated and are expected to cause significant changes in species, age classes and densities.

D. A score of (0) means that the hydrology and water quality does not support the functions and provides no benefits to fish and wildlife. The score is based on reasonable scientific judgment and characterized by a predominance of the following, as applicable:

1. Water levels and flows exhibit an extreme degree of deviation from what is appropriate, considering seasonal variation, tidal cycle, antecedent weather and other climatic effects.

2. Water level indicators are not present or are greatly inconsistent with expected hydrologic conditions for the type of system being evaluated.

3. Soil moisture has deviated from what is appropriate for the type of system being evaluated, considering seasonal variation, tidal cycle, antecedent weather and other climatic effects. Strong evidence of substantial soil desiccation, oxidation or subsidence is observed.
4. Soil erosion or deposition patterns are greatly atypical or indicative of greatly altered flow rates or points of discharge.
5. Fire history indicates great deviation from typical fire frequency or severity, due to extreme dryness.
6. Vegetation or benthic community zonation in all strata is inappropriate for the type of system being evaluated, indicating atypical hydrologic conditions.
7. Vegetation has strong evidence of much greater than normal mortality, leaning or fallen trees, thinning canopy or signs of insect damage or disease which may be associated with hydrologic stress.
8. Presence or evidence of use by animal species with specific hydrologic requirements is lacking and those species present have generalized hydrologic requirements.
9. The plant community composition consists predominantly of species tolerant of and associated with highly degraded water or alterations in frequency, depth, and duration in inundation or saturation.
10. Direct observation of standing water indicates significant water quality degradation such as obvious discoloration, turbidity, or oil sheen.
11. Existing water quality data indicates large deviation from normal for parameters such as salinity or nutrient loading, so that adverse ecological effects would be expected.
12. Water depth, wave energy, currents and light penetration are inappropriate for the type of community (species, age classes and densities) being evaluated.

2.03.03 COMMUNITY STRUCTURE

Each assessment area is evaluated with regard to its characteristic community structure. In general, a wetland or other surface water is characterized either by plant cover or by open water with a submerged benthic community. Wetlands and surface waters characterized by plant cover will be scored according to subparagraph C.1 below, while benthic communities will be assessed in accordance with subparagraph C.2 below. If the assessment area is a mosaic of relatively equal parts of submerged plant cover and a submerged benthic community, then both of these indicators will be scored and those scores averaged to obtain a single community structure score.

Vegetation and structure habitat – The presence, abundance, health, condition, appropriateness, and distribution of plant communities in surface waters, wetlands, and uplands can be used as indicators to determine the degree to which the functions of the community type identified are provided. Vegetation is the base of the food web in any community and provides many additional structural habitat benefits to fish and wildlife. In forested systems, for example, the vertical structure of trees, tree cavities, standing dead snag and fallen logs provide forage, nesting, and cover habitat for wildlife. Topographic features, such as flats, deeper depressions, hummocks, or tidal creeks also provide important structure for fish and wildlife habitat. Overall condition of a plant community can often be evaluated by observing indicators such as dead or dying vegetation, regeneration and recruitment, sizes and age distribution of trees and shrubs, fruit production, chlorotic or spindly plant growth, structure of the vegetation strata, and the presence, coverage and distribution of inappropriate plant species. Human activities such as mowing, grazing, off-road vehicle

activity, boat traffic, and fire suppression constitute more direct and easily observable impacts affecting the condition of plant communities. Although short-term environmental factors such as excessive rainfall, drought, and fire can have temporary impacts, human activities such as flooding, drainage via groundwater withdrawal and conveyance canals, or construction of permanent structures such as seawalls in an aquatic system can permanently damage these systems. The plant community should be evaluated to consider whether natural successional patterns for the community type are permanently altered. In appropriate plants, including invasive exotic species, other invasive species, or other species atypical of the community type being evaluated, do not support the functions attributable to that community type and can out-compete and replace native species. Native upland and wetland vegetation, such as wax myrtle, pines, and willow, which are not typically considered as invasive, can occur in numbers and coverage not appropriate for the community type and can serve as indicators of disturbance. The relative degree of coverage by in appropriate species, inappropriate vegetation strata, condition of vegetation, and both biotic and abiotic structure all provide an indication of the degree to which the functions anticipated for the community type identified are being provided.

A. A score of (10) means that the vegetation community and physical structure provide conditions which support an optimal level of function to benefit fish and wildlife utilizing the assessment area as listed in **Part 1**. The score is based on reasonable scientific judgment and characterized by a predominance of the following, as applicable:

1. All or nearly all of the plant cover is by appropriate and desirable plant species in the canopy, shrub, or ground stratum.
2. Invasive exotic or other invasive plant species are not present.
3. There is strong evidence of normal regeneration and natural recruitment.
4. Age and size distribution is typical of the system, with no indication of deviation from normal successional or mortality pattern.
5. The density and quality of coarse woody debris, snag, den, and cavity provide optimal structural habitat for that type of system.
6. Plants are in good condition, with very little to no evidence of chlorotic or spindly growth or insect damage.
7. Land management practices are optimal for long-term viability of the plant community.
8. Topographic features, such as refugia ponds, creek channels, flats or hummocks, are present and normal for the area being assessed.
9. If submerged aquatic plant communities are present, there is no evidence of siltation or algal growth that would impede normal aquatic plant growth.

B. A score of (7) means that the level of function provided by plant community and physical structure is limited to seventy percent (70%) of the optimal level. The score is based on reasonable scientific judgment and characterized by a predominance of the following, as applicable:

1. Majority of plant cover is by appropriate and desirable plan species in the canopy, shrub, or ground stratum.
2. Invasive exotic or other invasive plant species are present, but cover is minimal.
3. There is evidence of near-normal regeneration or natural recruitment.
4. Age and size distribution approximates conditions typical of that type of system, with no indication of permanent deviation from normal successional or mortality pattern, although there may have been temporary deviations or impacts to age and size distribution.
5. Coarse woody debris, snags, dens, and cavities have either slightly lower than or slightly greater than normal quantity due to deviation from expected age structure or land management.

6. Plant condition is generally condition, with little evidence of chlorotic or spindly growth or insect damage.
7. Land management practices are generally appropriate, but there may be some fire suppression or water control features that have caused a shift in the plant community.
8. Topographic features, such as refugia ponds, creek channels, flats or hummocks, are slightly less than optimal for the area being assessed.
9. In submerged aquatic plant communities, there is a minor degree of siltation or algal growth that would impede normal aquatic plant growth.

C. A score of (4) means that the level of function provided by the plant community and physical structure is limited to forty percent (40%) of the optimal level. The score is based on reasonable scientific judgment and characterized by a predominance of the following, as applicable:

1. Majority of plant cover is by inappropriate or undesirable plant species in the canopy, shrub, or ground stratum.
2. Majority of the plant cover and presence is comprised of invasive exotic or other invasive plant species.
3. There is minimal evidence of regeneration or natural recruitment.
4. Age and size distribution is atypical of the system and indicative of permanent deviation from normal successional pattern, with greater than expected amount of dead or dying vegetation.
5. Coarse woody debris, snags, dens, and cavities are either not present or greater than normal because the native vegetation is dead or dying.
6. Generally poor plant condition, such as chlorotic or spindly growth or insect damage.
7. Land management practices have resulted in partial removal or alteration of natural structures or introduction of some artificial features, such as furrows or ditches.
8. Reduction in extent of topographic features, such as refugia ponds, creek channels, flats or hummocks, from what is normal for the area being assessed.
9. In submerged aquatic plant communities, there is a moderate degree of siltation or algal growth.

D. A score of (0) means that the vegetative communities and structure habitat do not provide functions to benefit fish and wildlife. The score is based on reasonable scientific judgment and characterized by a predominance of the following, as applicable:

1. No appropriate or desirable plant species in the canopy, shrub, or ground stratum.
2. High presence and cover by invasive exotic or other invasive plant species.
3. There is no evidence of regeneration of natural environment.
4. High percentage of dead or dying vegetation, with no typical age and size distribution.
5. Coarse woody debris, snags, dens, and cavities are either not present or exist only because the native vegetation is dead or dying.
6. Overall very poor plant condition, such as highly chlorotic or spindly growth or extensive insect damage.
7. Land management practices have resulted in removal or alteration of natural structure or introduction of artificial features, such as furrows or ditches.

8. Lack of topographic features such as refugia ponds, creek channels, flats or hammocks that are normal for the area being assessed.
9. In submerged aquatic plant communities, there is a high degree of siltation or algal growth.

2.03.04 BENTHIC COMMUNITIES

This indicator is intended to be used in marine or freshwater aquatic systems that are not characterized by a plant community, and is not intended to be used in wetlands that are characterized by a plant community. The benthic communities within nearshore, inshore, marine and freshwater aquatic systems are analogous to the vascular plant communities of terrestrial wetland systems in that they provide food and habitat for other biotic components of the system and function in the maintenance of water quality. For example, oyster bars and beds in nearshore habitats and estuaries filter large amounts of particulate matter and provide food and habitat for a variety of species, such as boring sponges, mollusks, and polycheate worms. Live hard bottom community composition varies with water depths and substratum, but this community type contributes to the food web, as well as providing three-dimensional structure through the action of reef-building organisms and rock-boring organisms and water quality benefits from filter-feeding organisms. The distribution and quality of coral reefs reflect a balance of water temperature, salinity, nutrients, water quality, and presence of nearby productive mangrove and seagrass communities. Coral reefs contribute to primary productivity of the marine environment as well as creating structure and habitat for a large number of organisms. Even benthic infauna of soft-bottom systems stabilize the substrate, provide a food source, and serve as useful indicators of water quality. All of these communities are susceptible to human disturbance through direct physical damage, such as dredging, filling, or boating impacts, and indirect damage through changes in water quality, currents, and sedimentation.

A. A score of (10) means that the benthic communities are indicative of conditions that provide optimal support for all of the functions typical of the assessment area and provide optimal benefit to fish and wildlife. The score is based on reasonable scientific judgment and characterized by a predominance of the following, as applicable:

1. The appropriate species number and diversity of benthic organisms are optimal for the type of system.
2. Non-native or inappropriate species are not present and the site is not near an area with such species.
3. Natural regeneration, recruitment, and age distribution are optimal.
4. Appropriate species are in good condition with typical biomass.
5. Structural features are typical of the system with no evidence of past physical damage.
6. Topographic features, such as relief, stability, and interstitial spaces for hardbottom and reef communities or snags and coarse woody debris in riverine systems, are typical of that type of habitat and optimal for the benthic community being evaluated.
7. Spawning or nesting habitats, such as rocky or sandy bottoms, are optimal for the community type.

B. A score of (7) means that, relative to ideal habitat; the benthic communities of the assessment area provide functions at seventy percent (70%) of the optimal level. The score is based on reasonable scientific judgment and characterized by a predominance of the following, as applicable:

1. Majority of the community is composed of appropriate species; the number of diversity of benthic organisms slightly less than typical.
2. Any non-native or inappropriate species present represents a minority of the community or the site is immediately adjacent to an area with such species.
3. Natural regeneration or recruitment is slightly less than expected.
4. Appropriate species are in generally good condition, with little reduction in biomass from what is optimal.
5. Structural features are close to that typical of the system, or little evidence of past physical damage.
6. Topographic features, such as relief, stability, and interstitial spaces for hardbottom and reef communities or snags and coarse woody debris in riverine systems, indicate slight deviation from what is expected and is less than optimal for the benthic community being evaluated.
7. Spawning or nesting habitats, such as rocky or sandy bottoms, are less than expected.

C. A score of (4) means that, relative to ideal habitat, the benthic communities of the assessment area provide functions to forty percent (40%) of the optimal level. The score is based on reasonable scientific judgment and characterized by a predominance of the following, as applicable:

1. Appropriate species number or diversity of benthic organisms is greatly decreased from typical.
2. Majority of species present is non-native or inappropriate species or the site is immediately adjacent to an area heavily infested by such species.
3. Natural regeneration or recruitment is minimal.
4. Substantial number of appropriate species are dying or in poor condition, resulting in much lower than normal biomas.
5. Structural features are atypical of the system, or there is evidence of great or long term physical damage.
6. Topographic features, such as relief, stability, and interstitial spaces for hardbottom and reef communities or snags and coarse woody debris in riverine systems, are greatly reduced from what is expected and is not appropriate for the benthic community being evaluated.
7. Few spawning or nesting habitats, such as rocky or sandy bottoms, are available.

D. A score of (0) means that the benthic communities do not support the functions identified and do not provide benefits to fish and wildlife. The score is based on reasonable scientific judgment and characterized by a predominance of the following, as applicable:

1. Lack of appropriate species and diversity of those species, any appropriate species present are in poor condition.
2. Non-native or inappropriate species are dominant.
3. There is no indication of natural regeneration or recruitment.
4. Structural integrity is very low or non-existent, or there is evidence of serious physical damage.
5. Topographic features, such as relief, stability, and interstitial spaces for hardbottom and reef communities or snags and coarse woody debris in riverine systems, are lacking.
6. No spawning or nesting habitats, such as rocky or sandy bottoms, are present.

2.03.05 WETLAND FUNCTION SCORE SUMMARY

The **Part 2** score for a wetland or surface water assessment area shall be determined by summing the scores for each of the three indicators (location and landscape support, water environment, and community structure) and dividing that value by thirty (30) to yield a number between 0 and 1. This number will represent the WQAM score for the evaluated system.

PART II – Quantification of Assessment Area
Wetland Quality Assessment Method

Site/Project Name	Application Number	Assessment Area Name - Review (Original)
Assessment Area Acreage	**Review (Original) Assessment conducted by:**	**Review (Original) Assessment dates:**

Scoring Guidance	Optimal (10)	Moderate(7)	Minimal (4)	Not Present (0)
The scoring of each indicator is based on what would be suitable for the type of wetland or surface water assessed	Condition is optimal and fully supports wetland/surface water functions	Condition is less than optimal, but sufficient to maintain most wetland/surface water functions	Minimal level of support of wetland/surface water functions	Condition is insufficient to provide wetland/surface water functions

Location and Landscape Support Score	Notes:	Adjacent Landscape Description
Water Environment Score	Notes:	Soils Description Hydrology Description
Community structure 1. Vegetation and/or 2. Benthic Community Score	Notes:	Vegetation & Wildlife Notations FLUCFCS** Code:

WQAM Score Sum of above / 30 Score	Wetland Category Key - Application Package Requirements from Proposed Wetland Impacts		
	Minimal (0.00 - 0.40)	Moderate (0.41 - 0.70)	Optimal (0.71 - 1.0)
	Wetland Impact Analysis	Wetland Impact Analysis	Wetland Impact Analysis
	25' avg. 15' min. upland buffer	25' avg. 15' min. upland buffer	50' avg. 25' min. upland buffer
	Compensatory Mitigation	Compensatory Mitigation	Compensatory Mitigation
	State and federal permits	State and federal permits	State and federal permits
		Avoidance and Minimization Analysis	Avoidance and Minimization Analysis
			No Net Loss' Analysis

Section 2.04 APPLICATION OF SCORING

In order to protect highest quality wetland systems in a manner consistent with the Comprehensive Plan, the WQAM score (subsection 2.03.05 of this manual) is utilized to describe wetlands according to quality functions while determining permitting procedures. With the WQAM score, wetlands are ranked according to three (3) categories and are described as follows:

1. Optimal Wetlands – Named wetland systems associated with surface water bodies and/or WQAM score between 0.71 – 1.0.
2. Moderate Wetlands – WQAM score between 0.41 and 0.70.
3. Minimal Wetlands – WQAM score between 0.0 and 0.40.

The following table must be utilized to determine the appropriate action on behalf of the applicant:

Requirement in Application Package	**Optimal Wetland including named wetland systems associated with surface water bodies and WQAM score between 0.71 and 1.0**	**Moderate Wetland WQAM score between 0.41 and 0.70 [Wetland Impacts regulated by SJRWMD or FDEP]**	**Minimal Wetland WQAM score between 0.00 and 0.40 [Wetland Impacts regulated by SJRWMD or FDEP]**
Wetland Impact Analysis	YES	YES	YES
Alternatives analysis for avoidance and minimization	YES	YES	NO
Assurance of 'no net loss of wetland functions' for the wetland system(s) located on the project site	YES	NO	NO
Compensatory mitigation within the City is preferred. However, mitigation shall occur within the same hydrologic basin per SJRWMD, or as consistent with Section 62-345, *FAC*, as amended or succeeded (**1**)	YES	YES	YES
A natural upland buffer with an average width of 50 feet, but not less than 25 feet	YES	NO	NO
A natural upland buffer with an average width of 25 feet, but not less than 15 feet	NO	YES	YES
Provide copy of all requisite Federal and/or State wetland permits	YES	YES	YES

(1) Wetland Impacts regulated by St. Johns River Water Management District (SJRWMD) or the Florida Department of Environmental Protection (FDEP).

(2) In accordance with Section 373.4135 *FS*, the City shall not deny the use of a mitigation bank or off-site regional mitigation due to its location outside of City jurisdiction.

A. Application Package Details: The required information for wetland impacts may be compiled with listed species assessments in one (1) comprehensive report; however, the provided information must be referenced in a table of contents or other appropriate means to depict satisfaction of application requirements.

1. Wetland Impact Analysis Report. All project applications proposing to impact State jurisdictional wetlands must provide a report detailing, at a minimum, the following information. Additional report information beyond those listed below is required for moderate and optimal category wetland impacts and is described in subsection **2.04.A.2** and subsection **2.04.A.3** of this manual.

a. Narrative:

i. Qualified environmental professional(s). Detail overseeing professional utilized for the assessment with associated service capacity. Professional must hold a valid qualified environmental professional (QEP) designation from the CDD.

ii. Comprehensive site description. Comprehensive site description detailing existing conditions and associated land use activities. Description shall reference all figures as listed in subsection **2.04.A.1.b** below.

iii. WQAM analysis for all referenced on-site wetlands. If the assessment is deemed insufficient by City staff, the City may require, at the applicant's expense, an additional WQAM assessment from another qualified environmental professional.

iv. Level of function demonstration. A demonstration that the level of function provided to listed flora and fauna species will not be adversely affected. This section should focus on best management practices as described in *Florida Fish and Wildlife Conservation Commission* (*FWC*) and *U.S. Fish and Wildlife Service* (*USFWS*) publications and, if applicable, verification that issued permit conditions are satisfied.

v. Wetland impacts mitigation plan. Comprehensive mitigation plan for wetland impacts.

b. Figures: At a minimum, the following figures shall be provided; however, additional figures may be provided to better facilitate description of the site and the proposed activities:

i. Vicinity Map (1 inch = 10,000 feet)

ii. USGS 7.5' Topographic Quadrangle Map (1 inch = 5,000 feet)

iii. USDA Soil Survey Map (1 inch = 5,000 feet)

iv. Hydrologic Basin Map (1 inch = 5,000 feet): Project location in reference to the Pellicer Creek and Matanzas River Watershed, Crescent Lake Watershed, and Halifax River Watershed.

v. Vegetative Community Map (scale – N/A): Depicts all on-site communities and land uses per the latest edition of Florida Department of Transportation (FDOT) Florida Land Use Cover, and Forms Classification System (FLUCFS). If the applicant is submitting a comprehensive site analysis that includes listed species with the wetland impact analysis report, the community descriptions must also provide the Florida Natural Areas Identification (FNAI) type.

vi. Wetland Location Map – Aerial depiction referencing location of all waterbodies, watercourses, and wetland. Each feature shall be referenced with a unique wetland identification label to facilitate a better cross-reference with other applicable analysis.

vii. **Site Activities Map** – Depicting on-site wetlands, roads, easements, stormwater facilities, applicable buffers, building location(s), and other on-site facilities or structures. The map will provide hatching and supporting table detailing all on-site wetlands and associated natural buffers with associated activity – impacts (direct or secondary), on-site and off-site mitigation areas (preservation, creation, enhancement, etc.), and those to remain undisturbed. If the requested information is to overwhelming to depict on one map, additional depictions are permissible (see below '**site activities map**' figure).

2. **Alternative analysis for avoidance and minimization**. Alternative analysis for avoidance and minimization shall be provided for moderate and optimal wetland impact(s) located on the project site. The degree of impact to wetland functions caused by the proposed system, whether the impact to these functions can be mitigated and the practicability of design modifications for the site, as well as alignment alternatives for a proposed linear system, which could eliminate or reduce impacts to these functions, are all factors in determining whether an application will be approved by the City. Design modifications to reduce or eliminate adverse impacts must be explored. Adverse impacts remaining after practicable design modifications have been made may be offset by mitigation. An applicant may propose mitigation, or the City may suggest mitigation, to offset the adverse impacts caused by regulated activities. To receive City approval, a system cannot cause a net adverse impact on wetland functions and other surface water functions that is not offset by mitigation and in accordance with the requirements established by State law.

   If the proposed system will result in adverse impacts to wetland functions and other surface water functions then the City in determining whether to grant or deny a permit shall consider whether the applicant has implemented practicable design modifications to reduce or eliminate such adverse impacts.

   The term "modification" shall not be construed as including the alternative of not implementing the system in some form, nor shall it be construed as requiring a project that is significantly different in type or function. A proposed modification that is not technically capable of being done is not economically viable, or which adversely affects public safety through the endangerment of lives or property is not considered "practicable". A proposed modification need not remove all economic value of the property in order to be considered not "practicable". Conversely, a modification need not provide the highest and best use of the property to be "practicable". In determining whether a proposed modification is practicable, consideration shall also be given to the cost of the modification compared to the environmental benefit it achieves.

   The City will not require the applicant to implement practicable design modifications to reduce or eliminate impacts when:

   a. The ecological value of the functions provided by the area of wetland or other surface water to be adversely affected is low, based on a site specific analysis and the proposed mitigation will provide greater long term ecological value than the area of wetland or other surface water to be adversely affected, or

   b. The applicant proposes mitigation that implements all or part of a plan that provides regional ecological value and that provides greater long-term ecological value than the area of wetland or other surface water to be adversely affected.

   Should such mutual consideration of modification and mitigation not result in a permittable system, the City must deny the application. Nothing herein shall imply that the City may not deny an application for a permit as submitted or modified, if it fails to meet the conditions for issuance, or that mitigation must be accepted by the City.

3. **No net loss of wetland functions**. Assurance of 'no net loss of wetland functions' for optimal wetland system(s) located on the project site. Impacts to optimal wetlands shall not be considered unless first meeting avoidance and minimization standards as defined in **Chapter 14 – Glossary** in the *LDC*. In order to meet a 'no net loss of wetland functions', the functional loss resulting from the proposed wetland impacts must be offset or surpassed with on-site enhancement efforts to the same system. The applicant must provide a Uniform Mitigation Assessment Methodology (UMAM) evaluation that shall include, but not limited to, Qualitative – Part II (62.345, *FAC*) supporting that the activities will not result in loss of function from preconstruction and post-construction activities.

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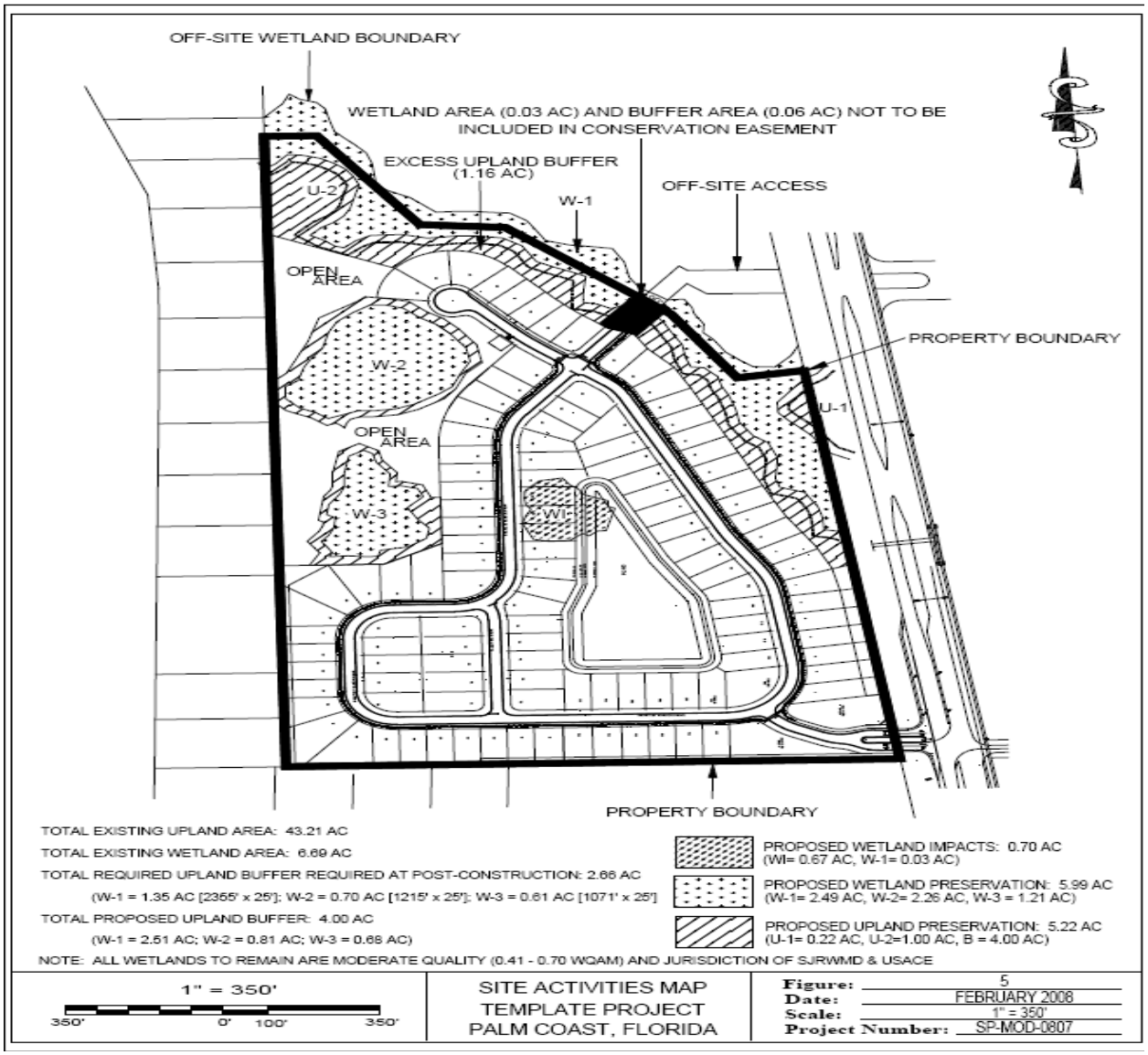
Site Activities Map



3.0I APPLICATION OVERVIEW

All developments, regardless of size and location, shall comply with state and federal regulations regarding listed species (endangered, threatened, and/or species of special concern) and species of conservation concern as identified in FWC Wildlife Action Plan (FWC 2005) that may be located or significantly dependent on a development site. All applicable permit(s) must be obtained and provided to the City prior to the preconstruction meeting. The following section(s) detail the sufficiency criteria for listed species assessments as required by applicable procedures within **Chapter 2** of the Unified Land Development Code.

A. Preliminary Ecological Assessment: The purpose of this assessment is to provide an overview of existing natural resource conditions onsite and within the vicinity while detailing common and potentially occurring listed flora and fauna species. In the event that the ecological assessment yields evidence of listed species existing or significantly dependent on the site, additional assessments and permit(s) may be required as detailed in subsection **3.01.B** of this manual. This assessment may be combined with other required assessments to better facilitate description of site conditions and project associated actions. If the applicant chooses to provide one (1) comprehensive environmental assessment, the required information must be referenced in a table of contents or other appropriate means to depict satisfaction of application requirements.

1. Narrative:

a. Qualified environmental professional(s): Detail professionals utilized for the assessment with associated service capacity. Each professional must hold a valid qualified environmental professional (QEP) designation from the CDD (**Section 1.01** of this manual).

b. Site description. Comprehensive site description detailing regional attributes with relevance to existing on-site conditions and associated land use activities. Vegetative communities and land-uses shall be referenced by FDOT Florida Land Use Cover, and Forms Classification System (FLUCFCS). Vegetative communities shall be cross-referenced with the comparable natural community descriptions as detailed by the Florida Natural Areas Identification (FNAI) Guide to the Natural Communities of Florida (February 1990).

c. Site evaluation methodology details. Site evaluation methodology details shall be provided that include, but not limited to site visit date(s) and time(s), weather conditions, pedestrian transect locations, point observation stations, anthropogenic disturbances, incidental observation documentation, etc.

d. Summary tables. Two (2) summary tables summarizing flora and fauna species to those observed (**Table 1**) and listed (**Table 2**). The following provides samples:

Table 1. Example of Flora and Fauna Summary Table
<Date and Time of observation to be inserted>

Common Name	Scientific Name	Common - Listed	Occurrence Type (Audible, Visual)	Habitat FNAI	Habitat FLUCFCS
Celestial lily	*Nemastylis floridana*	Listed	Visual	Basin Marsh	630
Red-shouldered hawk	*Buteo lineatus*	Common	Visual	N/A	In flight
Great egret	*Ardea alba*	Listed	Visual	N/A	In flight
Gopher tortoise	*Gopherus polyphemus*	Listed	Visual (Photograph 5)	Mesic Uplands Forested Mix	740, 814
Black racer	*Coluber constrictor priapus*	Common	Visual (Photograph 6)	Mesic Uplands Forested Mix	740, 814
Brown anole	*Anolis sagrei*	Common **	Visual	Mesic Uplands Forested Mix	434
Raccoon	*Procyon lotor*	Common	Visual – Tracks	N/A	510

** Exotic species – not native to Florida

Table 2. Example of Federal and State Listed Species Table
<Date inserted>

Common Name	Scientific Name	Designation (Federal, State)	Occurrence Potential	Date Observed
Celestial lily	*Nemastylis floridana*	(Threatened, N/A)	High	
Peregrine falcon	*Falco peregrinus*	(Endangered, N/A)	Very low	
Southeastern American kestrel	*Falco sparverious paulus*	(Threatened, N/A)	Very low	
Least tern	*Sterna antillarum albifrons*	(Threatened, N/A)	Very low	
Little blue heron	*Egretta caerulea*	(Species of Special Concern, N/A)	Low	

e. Listed species description. A detailed description shall be provided for each listed species with a low to moderate potential as noted in the provided **Table 2**. Occurrence potential shall be established by percent chance of being significantly dependent on the project site according to the following.

(i) Low – a range of 0 to 40 percent chance

(ii) Moderate - a range of 41 to 70 percent chance

(iii) High – a range of 71 to 100 percent chance

Within each description, ecology coupled with site observations and reasonable scientific information shall be discussed to justify the level of potential occurrence. All references including, but not limited to species management plans, survey protocols, recovery plans, journal publications, metadata, and web applications shall be cited in a reference section.

f. Summary. All discussions and findings should be summarized within a closing section (Conclusion) of the assessment. The qualified environmental professional shall provide a statement of the site's level of biodiversity regarding critical habitat and recommendations for further action.

2. Figures: At a minimum, the following figures shall be provided; however, additional figures may be provided to better facilitate description of the site and the proposed activities.

a. Vicinity Map (1 inch = 10,000 feet)

b. USGS 7.5' Topographic Quadrangle Map (1 inch = 5,000 feet)

c. USDA Soil Survey Map (1 inch = 5,000 feet)

d. Hydrologic Basin Map (1 inch = 5,000 feet): Project location in reference to the Pellicer Creek & Matanzas River Watershed, Crescent Lake Watershed, and Halifax River Watershed.

e. Community Map (scale – N/A): Depicts all on-site vegetative communities and land-uses with acreage or percent cover per the latest edition of FDOT Florida Land Use Cover, and Forms Classification System (FLUCFCS).

f. Transect Evaluation Location Map (scale – N/A): Provides transect locations as an overlay of the Vegetative Community Map. "Community" and "Transect" Maps may be combined if data may be easily ascertained.

g. Species Occurrence Map (scale – N/A): May be combined with Community Map and Transect Map if data may be easily ascertained. Provide locations of observations and documented occurrences that include, but not limited to established corridors, dens, nests, tracks, scat, individuals, database data, etc.

B. Species Specific Survey, Planning, and Conservation: In the event that listed species have been confirmed, this assessment shall be submitted as one of the following three options.

- **Option 1:** As an addendum to the preliminary ecological assessment;
- **Option 2:** A stand-alone document if above subsection **3.0.A** information is also provided; or
- **Option 3:** Part of a comprehensive assessment. If the applicant chooses to provide one (1) comprehensive environmental assessment, the required information must be referenced in a table of contents or other appropriate means to depict satisfaction of application requirements.

1. **Narrative:**
   - **a.** Qualified environmental professional(s): Detail professionals utilized for the assessment with associated service capacity. Each professional must hold a valid qualified environmental professional designation from the CDD.
   - **b.** Assessment Objectives: While referencing other assessments or reference materials, detail target species and habitats, project associated activities and agency permitting requirements.
   - **c.** Species survey methodology and findings: Provide details that include, but not limited to agency scientific collection permitting documentation, site visit date(s) and time(s), weather conditions, pedestrian transect locations, anthropogenic disturbances, observation documentation, monitoring, trapping, and results.
   - **d.** Conservation and management planning: Provide description of proposed site activities while demonstrating that the level of function provided to listed flora and fauna species will not be adversely affected. Staff recommends the use of FWC and USFWS publications and planning tools. Discussions shall focus on the following:
     - **(i)** Site planning strategies (impact avoidance and minimization, transportation elements, ecologically based recreation, connectivity to off-site resources);
     - **(ii)** Low impact design (LID) techniques (clustering, sustainable stormwater practices, shielded lighting, native landscaping, educational signage);
     - **(iii)** Conservation of priority habitats (ephemeral pond complexes, sandhill, oak hammocks, scrub);
     - **(iv)** Conservation of priority;
     - **(v)** Land management (invasive species control (flora and fauna), prescribed burning, mechanical treatments); and
     - **(vi)** Long-term objective-based vegetative and wildlife monitoring to ensure effective land management.
   - **e.** Permit status details. In the event that protected species cannot be completely avoided, a section must be provided that details federal and state agency coordination and permit status. A preconstruction meeting may not be held until all federal and state permits have been received.
   - **f.** Summary. All discussions and findings shall be summarized within a closing section (Conclusion) of the assessment.
2. **Figures:** At a minimum, the following figures shall be provided, in addition to those listed in subsection **3.0.A.1** of this manual; however, additional figures may be provided to better facilitate description of the site and the proposed activities:
   - **a.** Transect Evaluation Location Map (scale – N/A): Provides transect and if applicable trapping locations as an overlay of the Vegetative Community Map. If applicable, may replace subsection **3.0.A.2.e** of this manual.
   - **b.** Species Occurrence Map (scale – N/A): If applicable, may replace subsection **3.0.A.2.f** of this manual. Provide locations of observations and documented occurrences that include, but not limited to natural wildlife corridors, dens, nests, tracks, scat, individuals, burrows, roosts, rookeries, database data, etc.

c. **Site Activities Map** - depicting on-site critical communities including wetlands, roads, easements, stormwater facilities, applicable wildlife protection and water quality buffers, building location(s), and other on-site facilities or structures. The map will provide hatching and supporting table detailing all listed species with associated habitat and proposed activity – impacts (direct or secondary), on-site and off-site mitigation areas (preservation, creation, enhancement, etc.), and those to remain undisturbed. If the requested information is too overwhelming to depict on one (1) map, additional depictions are permissible.

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Section 4.01 OVERVIEW

The following information is from the City of Palm Coast, Florida Department of Agriculture Consumer Services, and Florida Department of Environmental Protection (FDEP) Best Management Practices for Agrichemical Handling and Farm Equipment Maintenance and Florida Department of Agricultural and Consumer Services Silviculture Best Management Practices, 1993.

4.01.01 CONSTRUCTION INDUSTRY WITHIN WELLFIELD PROTECTION AREA

A. The general contractor or, if none, the property owner, shall be responsible for assuring that each contractor or subcontractor evaluates each site before construction is initiated to determine if any site conditions may pose particular problems for the handling of any regulated substances (e.g., the handling of regulated substances adjacent to waterbodies or wetlands).

B. If any regulated substance is stored on the construction site, including fuel storage containers and dispensers during the construction activities, they shall be stored in a location and manner that will minimize any possible risk of release to the environment. Any storage container of 55-gallons (liquid), or 440 pounds (solid), or more containing regulated substances shall have an impervious containment system constructed of sufficient thickness, density, and composition that will prevent the discharge to the land, groundwater, or surface waters of any pollutant that may emanate from said storage containers or storage tanks. Each containment system shall be able to contain 110 percent of the contents of all storage containers above the containment systems.

C. Each general contractor shall be familiar the manufacturer's material safety data sheets (MSDS) supplied with each material containing a regulated substance and shall be familiar with the procedures required to contain and clean up any releases of the regulated substance. Any tools or equipment necessary to accomplish same shall be available in case of release (i.e. spill kits, booms, absorbent material).

D. Upon completion of construction, all unused or waste regulated substances and containment systems shall be removed from the construction site by the responsible contractor and shall be disposed properly as prescribed by law.

E. Contractors shall be responsible for taking measures to discourage vandalism that may cause releases of regulated substances from containers or vehicles on the construction site.

F. Extreme care shall be taken when performing maintenance or fueling activities so that spillage of fuels, oils, and other regulated substances does not occur.

G. If a discharge occurs, it shall be the responsibility of the general contractor and/or the property owner to follow these provisions. It shall be considered a violation if a discharge of regulated substances occurs and cleanup actions are not performed.

4.01.02 GENERAL BUSINESS PRACTICES / CONTAINMENT

A. Weekly Inspections for Regulated Businesses. All regulated businesses shall conduct weekly inspections of containers holding a regulated substance for leaks. Visual inspection is satisfactory provided the location of the containers can be inspected to a degree that reasonably assures that breakage or leakage can be detected by such inspection. Monitoring and inspection records shall be kept if they are required by other federal or state regulations. Storage tank owners shall follow the inspection and inventory requirements of Chapter 62-761, *FAC*.

B. New Construction Containment of Regulated Substances. Leak-proof trays, floor curbing, or other secondary containment systems shall be installed under container of liquid Regulated Substance. The secondary containment shall be of adequate capacity to handle all spills, leaks, overflows, and precipitation until appropriate action can be taken. The specific design and selection of materials shall be appropriate to preclude any Regulated Substance loss to the environment. Containment systems shall be operated so that the intrusion of precipitation is effectively managed.

4.01.03 GENERATORS HAZARDOUS WASTE

A. It shall be the facility's responsibility to stay current with hazardous waste regulations and be in compliance with all applicable federal, state, and local regulations.

B. All small and large quantity generators shall obtain an FDEP/EPA ID Number.

C. Containers (e.g. drums, cans, etc.) must be kept closed, in good condition, inspected at least weekly, and be compatible with other stored hazardous waste. Inspections must be kept on file.

D. Facility personnel must meet hazardous waste facility regulatory training requirements.

E. All hazardous waste generators shall develop a written contingency plan and emergency procedure plan. These requirements are intended to ensure that employees are adequately prepared to handle hazardous waste and to respond to any emergencies that may negatively impact groundwater resources. At a minimum, the plan shall:

1. Be well organized so that information is obtained quickly in an emergency. A detailed Table of Contents and page numbers should be provided. A cover page shall give the facility name, location, phone number, FDEP/EPA ID (if applicable), and date prepared.
2. Describe the actions that facility personnel must take in an imminent or actual emergency. The actions should be specific to the hazardous waste or regulated substances handled and to the characteristics of the facility and surroundings (e.g. canals, stormwater ponds, and well location,).
3. Include emergency response contractors, agency phone numbers, and agency contacts.
4. Proper management, emergency response and remedial action procedures for spills, including emergency equipment availability (neutralizing agents, spill absorbents, overpack drums, spill kits) and locations.

4.01.04 GEOTECHNICAL BORINGS

A. All borings deeper than 20 feet shall be neat cement grouted to the surface to prevent downward migration of surface and subsurface contaminants along the borehole to the shallow intermediate or Floridan Aquifer.

B. All borings less than 20 feet deep shall be backfilled with the original drilled soil to the surface to prevent the creation of a sump. Where the boring is advanced through asphalt or concrete it shall be patched at the surface with a similar impervious material.

C. If contamination is detected in any geotechnical boring, the contaminated soil shall not be used as replacement material and the horizontal and vertical extent of the contamination shall be assessed and reported to the City and the appropriate regulatory authority.

4.01.05 REPORTING OF DISCHARGES

A. Any discharge of a hazardous substance at federal or state reporting thresholds shall be reported as soon as possible or within twenty-four (24) hours of a known discharge/spill by the facility owner, operator, or responsible party to the City's Community Development Department. Such notification shall in no way alleviate the owner, operator, or responsible party from other federal and state reporting obligations as required by law. In addition, the following substances and chemicals shall be reported to the City if discharged in an amount equal to or greater than one (1) gallon:

1. Chlorinated Hydrocarbon Solvents including, but not limited to:

a. Carbon Tetrachloride

b. Tetrachloroethylene

c. Trichloroethylene

d. 1,1,1, - Trichloroethane

e. 1,2 – Dichloroethane

f. Methylene Chlorida

4.01.06 PROPER DISPOSAL OF HAZARDOUS SUBSTANCES

A. Inventory / Manifest documentation required by the Resource Conservation and Recovery Act (RCRA) -40 *Code of Federal Regulations* (*CFR*), Part 262 Subpart B shall be required to be kept by each facility that is regulated by RCRA for all substances that are used or considered waste products to ensure that all substances are handled in an environmentally acceptable manner for each hazardous substance.

B. All regulated businesses that are not regulated by RCRA shall be required to keep an inventory of the type(s) of hazardous substances that are used or considered waste products to ensure that all substances are handled in an environmentally acceptable manner. The method of record keeping may be of their own choosing, however, such records shall allow

inspectors to determine if used or waste products are being disposed of in compliance with federal, state, and local laws.

C. Each regulated businesses not regulated by RCRA shall be required to keep an inventory of the type(s) of hazardous substances that are used or considered waste products to ensure that all substances are handled in an environmentally acceptable manner. The method of record keeping may be of their own choosing, however, such records shall allow inspectors to determine if used or waste products are being disposed of in compliance with federal, state and local laws.

D. Disposal records shall be made available during normal business hours for the purpose of inspection.

4.01.07 WELL ABANDONMENT

A. Any abandoned well that is not being used for removing groundwater from an aquifer, recharge, determining quantity, quality, level or movement of ground water; and removing or exchanging heat shall be properly abandoned at the property owner's expense following the guidelines established by the St. Johns River Water Management District (SJRWMD).

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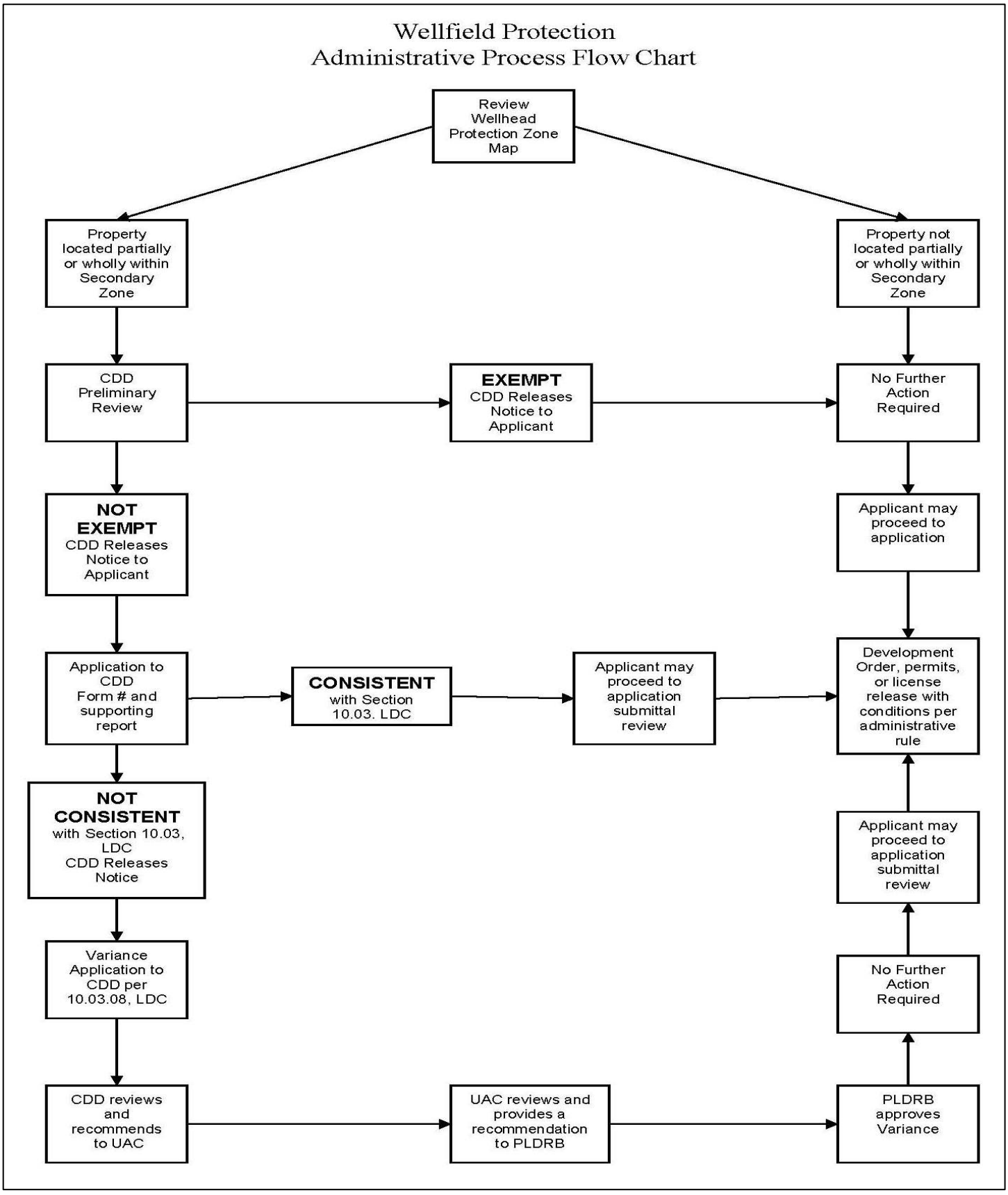
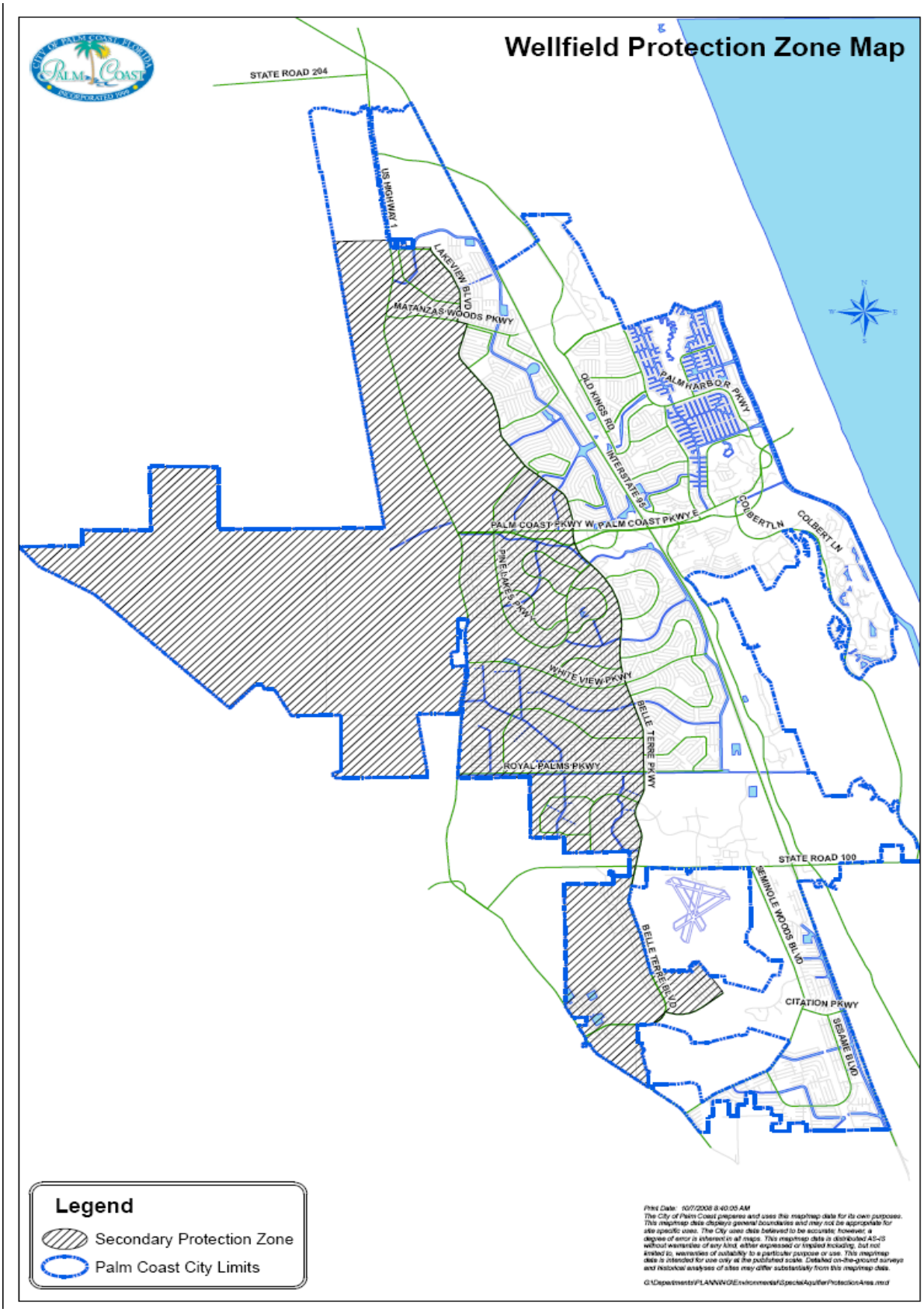
Wellfield Protection Administration Process Flow Chart



Wellfield Protection Zone Map



APPENDIXES for BEST MANAGEMENT PRACTICES

Appendix A **RECOMMENDED MANAGEMENT PRACTICES for the REMOVAL OF HAZARDOUS MATERIALS FROM BUILDING PRIOR TO DEMOLITION**

Recommended Management Practices for the Removal of Hazardous Materials from Buildings Prior to Demolition

Prepared by:
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Sponsored by:
The Florida Center for Solid and Hazardous Waste Management
University of Florida
Gainesville, Florida

and

The Florida Department of Environmental Protection
Bureau of Solid and Hazardous Waste Management
Tallahassee, Florida

This document was produced under work sponsored by the Florida Center for Solid and Hazardous Waste Management at the University of Florida. The principal investigator was Dr. Timothy G. Townsend, Department of Environmental Engineering Sciences, University of Florida. The student assistants who participated in the development of this document were Scott Sheridan, Matthew Hicks, Gary Royal, Ryan Davis, and Brad Mercure.

The Florida Department of Environmental Protection project office for this project was Jack Price. His review and guidance, as well as that of David Kelley are acknowledged. Standard Demolition, Quicksilver Environmental, and Beers Construction are acknowledged for their support.

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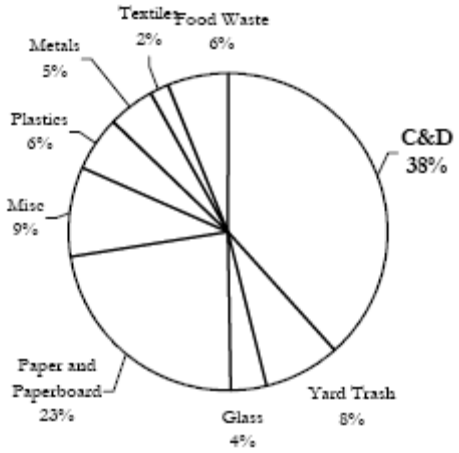
INTRODUCTION

Demolition Waste in the United States

Demolition waste results from the demolition of manmade structures. Demolition waste is often grouped together with construction waste as construction and demolition (C&D) waste. C&D presents a challenge to waste management professionals as a result of the large amount generated and the minimal attention it has received in the past.



Composition of Municipal Solid Waste

The United States Environmental Protection Agency (1998) estimates that C&D waste comprises approximately 38% of the municipal solid waste stream. That excludes waste generated in the construction of roadways or bridges, or in land clearing. The large amount of C&D waste generated and the recognized potential of the environmental impact of C&D waste management have focused attention on this waste stream. New rules require groundwater monitoring of disposal sites, but it is always desirable to *prevent* contamination of groundwater by removing any hazardous materials from the waste before it is landfilled.

Minimizing the environmental risks caused by demolition waste is the focus of this document.

What is in Demolition Waste?

The primary components of demolition waste are the materials that modern society depends on for its homes, offices and other buildings – concrete, wood, metal, and drywall. These items are generally viewed to have minimal impact on the environment upon disposal. Other items found in demolition wastes may present a greater risk to human health and the environment because of chemicals found within them.

Hazardous Materials in Demolition Waste

Some components encountered as part of the demolition waste stream contain hazardous materials and chemicals. Although these building components may be useful and beneficial to modern society, proper care must be taken upon their disposal. Most of these items may be easily removed prior to demolition. Thus with proper planning and foresight, a great majority of the environmental risk associated with the management of waste from a demolition project can be eliminated. Most hazardous building components can also be recycled by specialized processing facilities.

Materials that may result in possible risk to human health and the environment when improperly managed include lamps, thermostats, and light switches containing mercury; batteries from exit signs, emergency lights, and smoke alarms; lighting ballasts which contain polychlorinated biphenyls (PCBs); and lead pipes and roof vent flashings. A summary of these components and their potential risks are presented in the following table.

Hazardous Building Components Covered in Document

Fluorescent Light Bulbs that contain *mercury*. Mercury filled 4 ft, 8 ft, U-tube, circline, and compact fluorescent lamps are the most common types of fluorescent bulbs encountered.

High Intensity Discharge (HID) lamps that contain *mercury*. These lamps are often encountered in security and outdoor lighting applications. HIDs are also found in indoor, high ceiling work areas such as warehouses and supermarkets.

Thermostats that use *mercury* as a switching mechanism. The number of ampoules containing mercury depends on the temperature cycle and type of thermostat.

Mercury-bearing wall switches that use *mercury* as an electrically conductive switching mechanism. These "silent switches" are no longer manufactured but they can still be found in older structures. Numerous industries also use mercury for various types of switches and relays.

Lighting Ballasts for fluorescent light bulbs and HID lamps. These items may contain *Poly-chlorinated Biphenyls* (PCBs) as well as other toxic chemicals such as bis(2-ethylhexyl)ester di(2-ethylhexyl)phthalate (DEHP).

Batteries encountered in emergency lighting, exit signs, security systems, and alarms. These batteries may contain *lead* and *cadmium*.

Lead Roof Flashings used to protect roof vents. Flashings mold easily and often contain pure *lead*.

Other Lead objects such as *lead pipes* and *lead painted surfaces*. Surfaces such a door frames and window sills may be easily removed.

Other hazardous materials such as discarded *paint, oil, pesticides, cleaners* and other chemicals.

Why are Hazardous Building Components a Concern?

When chemicals such as mercury, lead, and cadmium are disposed of as part of hazardous building components, they may enter the environment and contaminate soil and groundwater. They may also pose a risk to workers at C&D recycling facilities and contaminate some of the products produced by recycling of demolition waste.

In most states, many of these materials are prohibited from disposal. Some examples are batteries, thermostats, PCB ballasts, and lamps in large quantities. The demolition contractor may take the

next step and remove all such materials from a building prior to demolition.

Objective of Document

The goal of this document is to provide recommended management practices for identifying and extracting easily removable hazardous materials from a building prior to demolition. This document can be used by demolition contractors, environmental regulators, local government, and C&D facility operators. The application of the procedures outlined in this document will result in fewer hazardous chemicals entering the environment. Such practices will help operators of C&D landfills maintain compliance with federal and state requirements for protecting groundwater quality at C&D disposal facilities. The removal of hazardous building components prior to a demolition project helps minimize any long-term contractor and client liability for the disposal of demolition waste.

Organization of Document

This document is designed to provide an overview of the demolition waste components that can present a risk to human health and the environment, as well as specific guidance for the removal of such items. A series of fact sheets are provided describing the various types of hazardous building components commonly encountered. Separate procedures for removal, storage, and disposal are covered as well. The process of conducting a predemolition audit is reviewed and illustrated with two case studies from actual demolition projects. A glossary of terms used throughout the document is also provided.

Since many states have specific regulations addressing the management of items such as batteries and fluorescent lamps, an appendix is provided with contact information for various state environmental protection department solid and hazardous waste programs.

A reference guide for specific sections of the document is presented as follows:

Reference Guide:

MANAGEMENT OF DEMOLITION WASTE

Demolition of Structures

Demolition waste is the waste generated from the dismantling or renovation of buildings, streets, bridges, and other man-made structures. The composition of demolition waste is similar to that of construction waste consisting largely of concrete, metals, drywall, and wood. Unlike typical construction waste, demolition waste may also contain hazardous building components such as mercury thermostats, mercury-lined fluorescent lamps, PCB ballasts, lead acid and nickel-cadmium batteries, and lead flashings. If not removed prior to demolition, these materials become mixed with the other demolition waste components and become very difficult to separate.

Steps to Demolishing a Building

Most demolition waste is generated and disposed of by licensed contractors. In most states, demolition requirements vary by county and municipality. The following list summarizes the typical steps a contractor must follow in order to demolish a structure.

1. A state-licensed contractor or the property owner must perform the demolition.

2. A demolition permit from the city or county building department is required. The permit entails disconnection of utility services and removal of hazardous materials such as asbestos.

3. The building department must approve the permit prior to demolition. This involves a preliminary inspection to verify the permit compliance.

4. After demolition, the contractor must pass a final inspection. This insures the termination of utilities and removal of debris.

These guidelines were developed from a survey of several counties in Florida. With the exception of asbestos, none of the respondents had specific requirements for the removal of hazardous materials. The existing inspection and permit process could easily include other procedures. As a liability matter, local city or county permit agencies should be consulted for specific requirements.

Environmental Impacts of Demolition Waste

Solid waste generated during a demolition project is typically managed by recycling some or all of the demolished structure or by disposal in a landfill. For both of these management strategies, the removal of hazardous materials *before* the demolition of a structure is necessary to protect human health and the environment. The removal of hazardous materials *after* demolition is in most cases not practical or possible.

Disposal by Landfills

Disposal in a sanitary landfill is the most common means of managing demolition waste. Referred to in the past as "dumps," modern landfills are designed and operated to meet strict regulations for protecting human health and the environment. There are several types of landfills that differ in the types of waste they accept. Landfills that receive household and commercial waste require an elaborate liner system to be installed to protect the groundwater from contamination. Certain types of landfills, those that receive wastes that do not pose a major risk to groundwater contamination, are not required to have liners.

Most C&D landfills are unlined, and demolition waste is usually disposed of in these types of facilities. Private companies operate many of the facilities, but a few government agencies operate C&D as well. One of the requirements of operating a C&D landfill is that waste loads be "spotted" to remove any items that are not C&D waste and may cause some source of pollution. Removing every hazardous component from a mixed waste stream, especially one like demolition waste where the material is typically crushed, is not always possible.

When solid waste is placed in an unlined landfill, the action of rainfall percolating down through the waste creates a liquid known as "leachate." If a hazardous material is present in the waste stream, it may "leach" from the landfilled material with infiltrating rainfall to form "leachate." The leachate migrates from the landfill and without any liner comes in contact with the underlying soil and groundwater supply.

Once leachate mixes with the groundwater underneath the landfill, it migrates away from the site with the groundwater flow. The result is the possible contamination of nearby drinking water wells.

Recycling of Demolition Waste

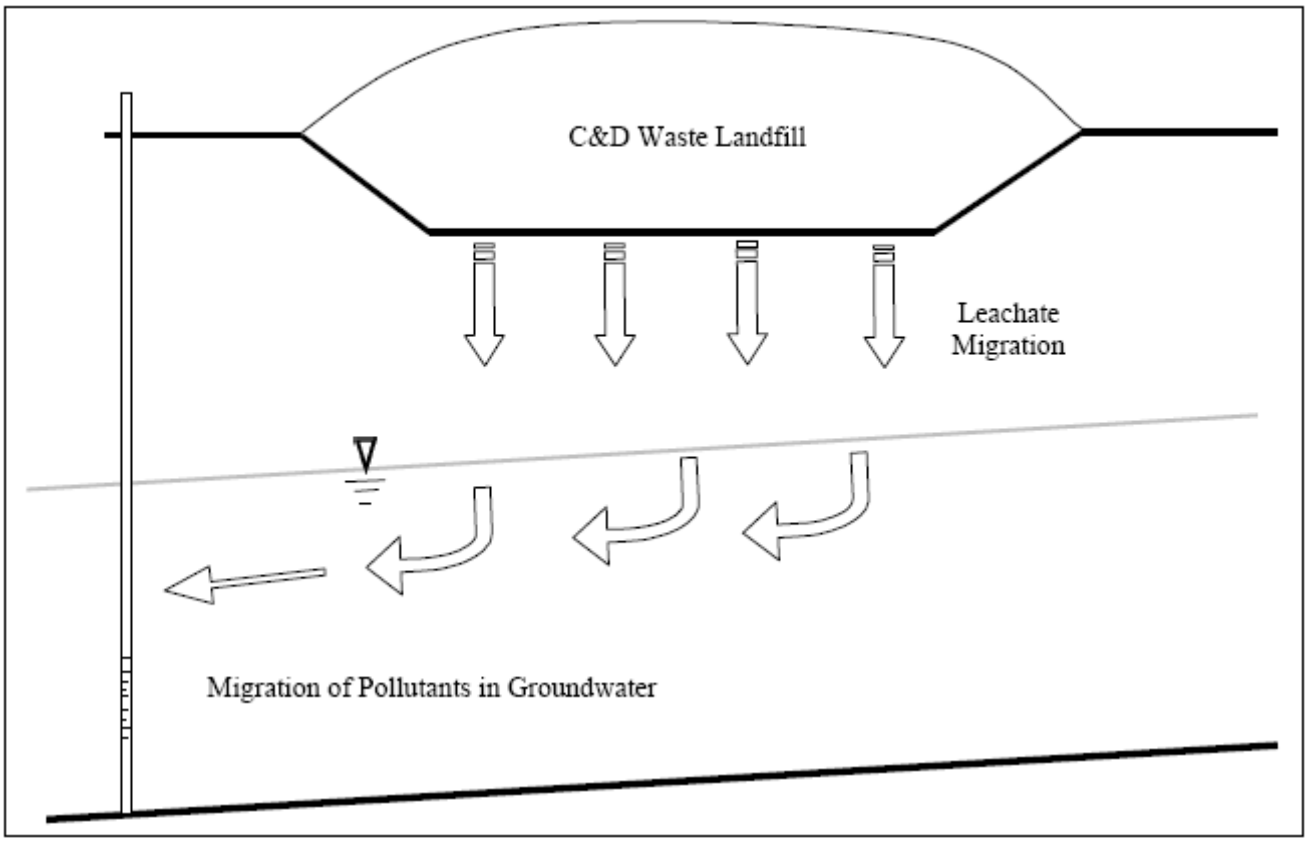
A practice that is becoming more common is the recycling of demolition waste. Demolition recycling ranges from the "deconstruction" of a building with separation of the materials at the demolition site to the processing of mixed demolition waste for recyclable material recovery. With both of these options, the removal of the structure's hazardous components is a necessary step to ensure worker safety and the value of the recovered product.

The removal of hazardous building components is a good idea for two reasons. First, since much of the separation is performed by manual labor, the removal of hazardous components reduces worker safety risks. Second, purity of the product created by the recycling facilities is adversely affected by the presence of hazardous chemicals.

Recycling of construction and demolition waste has developed into a large industry. For mixed demolition waste, materials recovery facilities (MRFs) have been constructed to separate certain materials from the waste stream. Waste materials are separated by a combination of mechanical and manual separation. The process usually involves crushing the waste in the early stages of the process to aid in the mechanical separation of the material.

Materials such as wood, concrete, and metal have markets ready to accept them. A key to successful recycling is to keep the degree of contamination of the material to a minimum. Purity of the recovered product ensures higher resale value. Removal of hazardous building components is an obvious step to achieve this.

One of the larger products by volume from a typical C&D MRF is a recovered soil fraction. This fraction accounts for 25% or more of the recovered waste stream at some facilities. The recovered soil fraction may be used as clean fill for off-site operations, provided that the material is safe. The presence of hazardous building components increases the likelihood of contamination.



Leachate from Hazardous Building Components Migrating to Groundwater

Recovered Fines Being Produced at a C&D Waste Recycling Facility

HAZARDOUS BUILDING COMPONENTS IN DEMOLISHED STRUCTURES

A number of building components may contain hazardous chemicals

Indoor Lighting Units

Many types of light bulbs are used by modern society. The standard incandescent bulb (or tungsten filament bulb) is the standard light bulb used by most common light fixtures in homes. These bulbs produce light by passing an electric current through a filament. Halogen bulbs produce greater amounts of light by the addition of a halogen gas to the inside of the bulb. Standard incandescent bulbs and halogen bulbs contain relatively inert material and their disposal is not a great concern.

Alternative types of bulbs (gas discharge bulbs) produce light when an electrical current is passed through them. Mercury vapor is extremely efficient in producing low-heat, energy-efficient light. Both fluorescent bulbs and high intensity discharge (HID) lamps utilize mercury vapor. Fluorescent bulbs are used frequently in indoor environments and HID lamps provide bright light for indoor areas such as warehouses and supermarkets.

The United States Environmental Protection Agency encourages the use of efficient power consumption and the use of fluorescent and HID lamps. Mercury, however, is a chemical that can be dangerous to human health and wildlife and thus must be controlled upon disposal.

Indoor fluorescent lighting and HID lighting units may also require the use of a ballast. Ballasts provide an initial starting voltage and current required to excite the gaseous atoms and control the electric current going to the lamp. Ballasts may contain chemicals such as PCBs that are hazardous to human health and the environment.

Outdoor Lighting

Outdoor lighting units typically require brighter light than indoor sources. Examples include streetlights and security lights. High Intensity Discharge (HID) lamps are well suited for energy efficient outdoor applications. These lamps utilize mercury vapor and outdoor lighting units equipped with HID bulbs also require ballasts that possibly contain hazardous chemicals.

Emergency Lighting and Exit Signs

Building safety codes require that emergency lights and exit signs be used in numerous structures. Backup power must be provided in order to operate these devices in the event of a power failure. Such backup power is often provided by rechargeable batteries. Both lead acid and nickel-cadmium batteries are found in use with emergency lighting and exit signs.

Incandescent or halogen bulbs are typically used in emergency lighting. Mercury-containing compact fluorescent bulbs are encountered in some exit sign lighting.

Electrical Switching Mechanisms

The ability of mercury to flow as a liquid at room temperature and its excellent properties for electrical conductance have resulted in this metal's use in a number of electrical switching mechanisms. Mercury is used in some thermostats, light switches, and electrical relays.

Other Battery Containing Devices

In addition to exit signs and emergency lights, batteries are also encountered in other components. Security alarm systems

use batteries as a source of backup power. Smoke detectors and carbon monoxide detectors are powered by small battery sources.

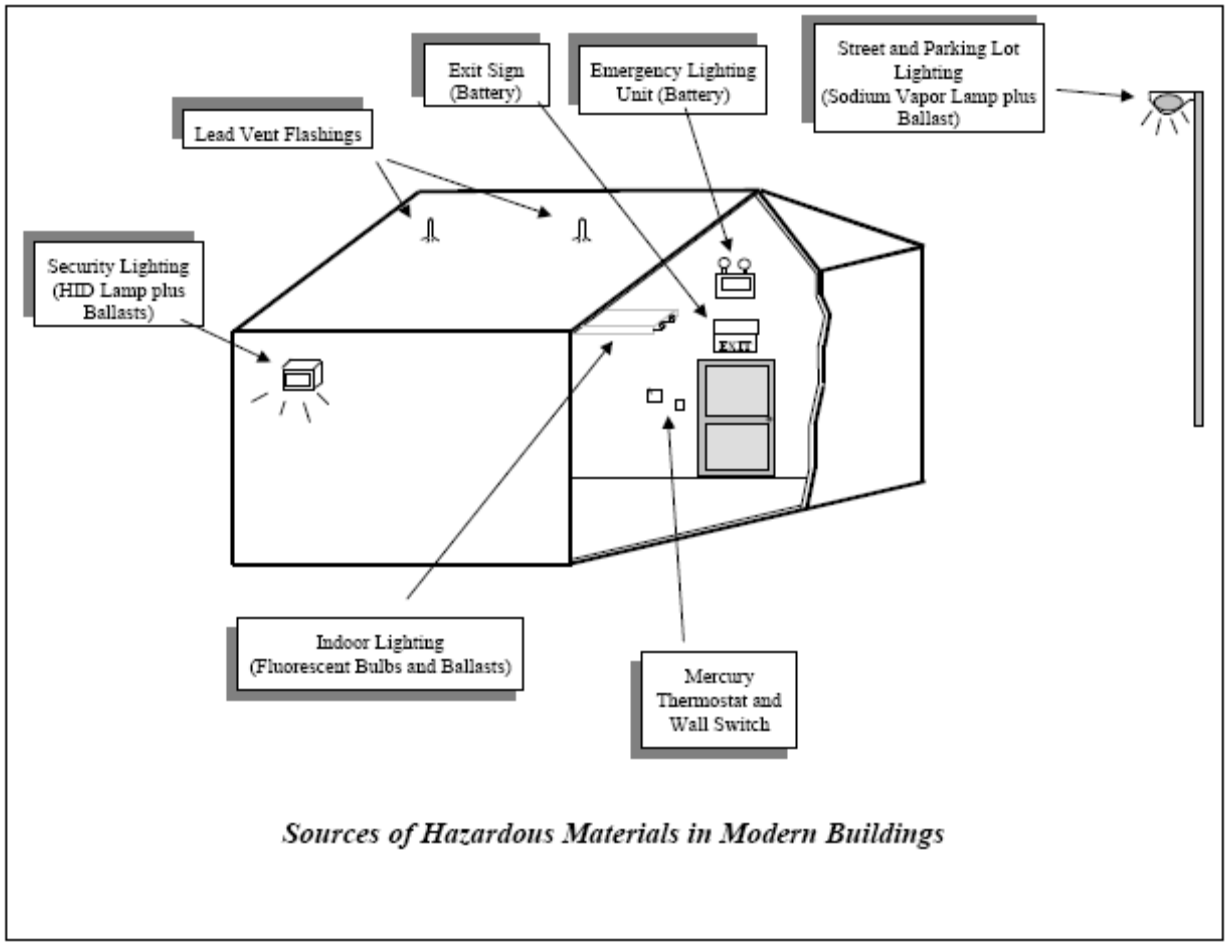
Lead Devices and Objects

Lead is found in a number of areas in manmade structures. Lead is used in roofing applications for flashing because of its structural characteristics and its ability to easily mold around objects. Lead flashing is often used to seal and protect clean-out pipes on the roofs of houses. Older buildings may have large amounts of lead pipe. An object painted with lead paint, such as doorframes or windowsills may be easily removed prior to a building's demolition.

Fact Sheets

The following fact sheets are provided as a reference:

- Fluorescent Light Bulbs
- High Intensity Discharge Lamps
- Mercury Thermostats
- Mercury Switches
- Lighting Ballasts
- Batteries
- Lead Flashings
- Other Lead Objects



Sources of Hazardous Materials in Modern Buildings

FACT SHEET: Fluorescent Light Bulbs

How They Work Fluorescent lamps operate on the principal of exciting mercury atoms enclosed in a glass bulb with an electric current. The excited atoms give off ultraviolet (UV) light upon their return to their natural state. The UV light is converted to visible light by a special phosphor that coats the inside of the fluorescent tube.

Efficient Lighting Fluorescent bulbs have found increasing use in recent years because of their efficiency in regard to energy consumption. The U.S. EPA has established the "Green Lights" program to encourage the use of high-efficiency fluorescent bulbs in indoor lighting applications. Spent bulbs must be managed appropriately because of the mercury content.

Where is the Mercury Located? Most of the mercury associated with a fluorescent bulb is encountered in the phosphor coating on the inside of the bulb as divalent mercury (Hg^{2+}). Only a small fraction of the mercury is found as vapor inside the bulb, but this fraction readily escapes when the bulb is broken.

Types of Bulbs Fluorescent light bulbs take many shapes. Conventional fluorescent bulbs include straight tubes, U-bent, and circline. These fluorescent bulbs require a ballast to provide an initial starting charge needed to excite the gaseous atoms and control the electric current going to the lamp.

Building Component Database: Fluorescent Light Bulbs

Hazardous Chemical: Mercury (Hg)

Average Amount: 30 mg

Mercury Location: Entire tube

Average Life Expectancy: 7,000-20,000 hrs.

Lamp Location: Lamp fixtures in any manmade structure. Indoor or under overhangs.

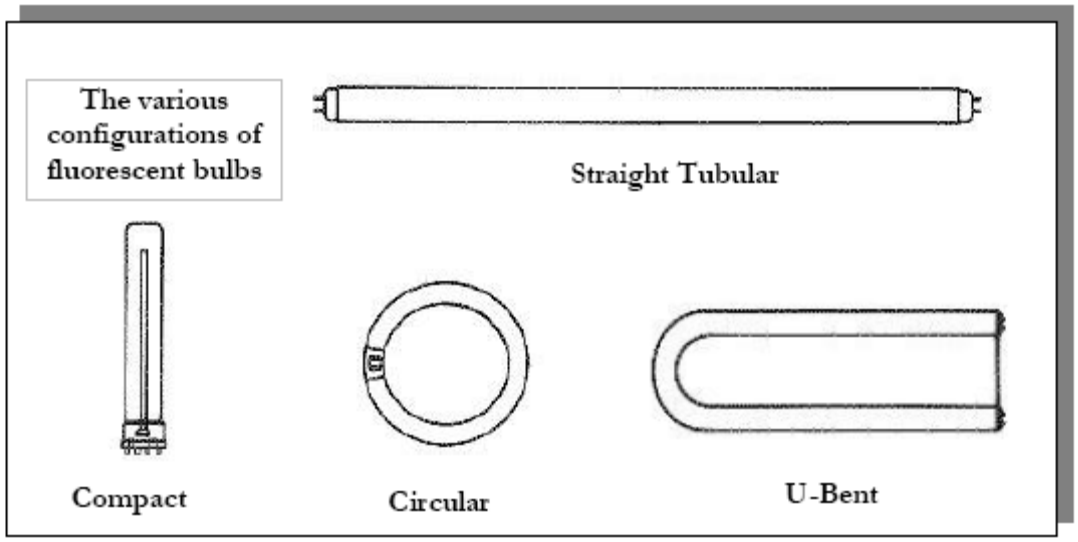
Regulated under: RCRA, various state regulations

Major Manufacturers: General Electric, Philips, Sylvania

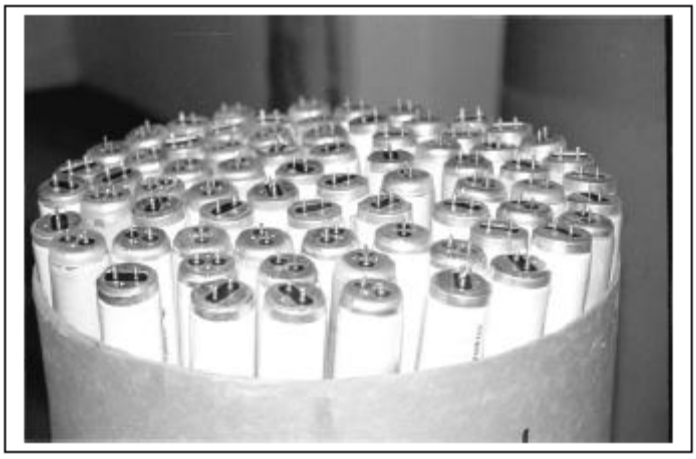
Types: 4-foot, 8-foot, compact, u-tube, circline

Health Effects: Deterioration of nervous system and brain. Birth defects and death.

Compact Fluorescents One of the fastest growing trends in lighting is the use of compact fluorescent bulbs. Compact fluorescents are a popular choice for retrofitting and new lighting installations because of their extremely high efficiency, long life, and low burn temperature. These bulbs are ideal for retrofitting because they can be used in standard incandescent light sockets. Since they are a type of fluorescent lamp, they require a ballast to operate. Compact fluorescents with a screw base have a ballast attached to the lamp. Some lamps plug into ballast adapters that can screw into an incandescent socket. Otherwise, a separate ballast will be located somewhere near the lamp.



Mercury in the Environment Mercury-containing lamps are one of the largest sources of mercury in municipal solid waste. Conventional disposal of mercury lamps releases between 700 and 900 kg of mercury into the atmosphere each year. Mercury is released into the atmosphere when lamps are incinerated or broken. Mercury may also be carried to the environment with gas emissions from landfills. Even small emissions are cause for concern because mercury tends to bioaccumulate in the food chain. For example, mercury may bioaccumulate in the tissue of fish, making the fish harmful for human consumption.



Mercury Lamp Recycling A number of businesses have developed to recycle mercury-containing lamps and bulbs. Recycling of fluorescent lamps results in the recovery of glass, metal, and mercury contaminated phosphor powder that can be further processed to reclaim mercury.

FACT SHEET: High Intensity Discharge Lamps

How They Work

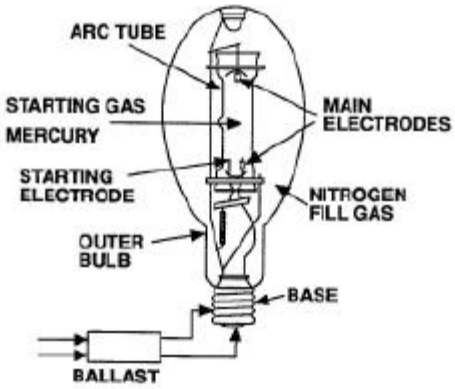
The three major types of high intensity discharge (HID) bulbs are the *mercury vapor*, the *high pressure sodium*, and the *metal halide lamps*. All HID lamps have an inner arc tube contained within an outer tube. The arc tube consists of a starting electrode, a main electrode, a starting gas, and arc metal. When an electric field is passed between the electrodes the starting gas ionizes. The charged starting gas volatalizes the arc metal, decreasing the resistance between the electrodes, and thus creating an arc.

Similar to fluorescent lighting, the charged metal atoms in the arc give off ultraviolet light when excited electrons return to lower orbitals. The outer bulb serves to absorb short wave ultraviolet energy and filter out unnatural light. The outer bulb is made of a heat resistant glass that keeps the arc tube at a constant temperature. Nitrogen gas fills the cavity between the inner and outer tubes and helps prevent oxidation.

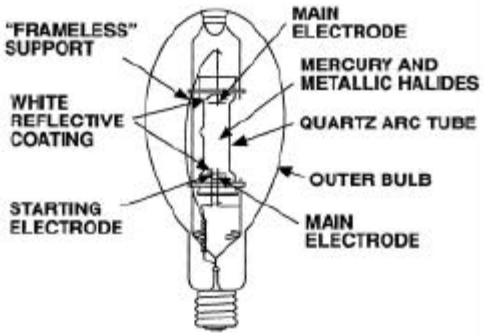
Mercury Vapor HID Lamps Mercury vapor lamps contain an all quartz arc tube filled with mercury arc metal and argon as a starting gas. The quartz arc tube emits ultraviolet light that is partially absorbed by the outer tube. Better color for some mercury lamps can be attained if the outer tubes are coated with phosphor. Phosphor converts near ultraviolet energies to visible light. In general, mercury vapor lamps have good efficiency, long life, and can be burned in any position. Applications include security, industrial facilities, and parking lots.

Metal Halide HID Lamps

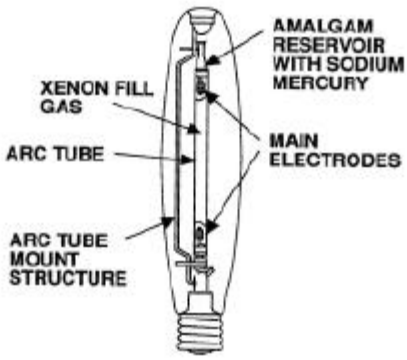
Metal halide lamps contain fused quartz arc tubes filled with a starting gas and a mixture of mercury and halide salts known as an amalgam. The outer tube of some metal halide lamps can contain a phosphor coat. Typical halide salts include sodium iodide, scandium iodide, thallium iodide, and indium iodide. When the iodides vaporize in the arc they form different colored layers around the mercury arc. Metal halide lamps have a bimetal switch which activates the main electrode once the arc is formed. In general, metal halide lamps have very good efficiency, long life, and superior optical control but



Mercury Vapor Lamp



Metal Halide Lamp



High Pressure Sodium

Figures courtesy of General Electric Lighting

cannot be burned in any position without affecting performance. Applications include floodlights, commercial buildings, and walkways.

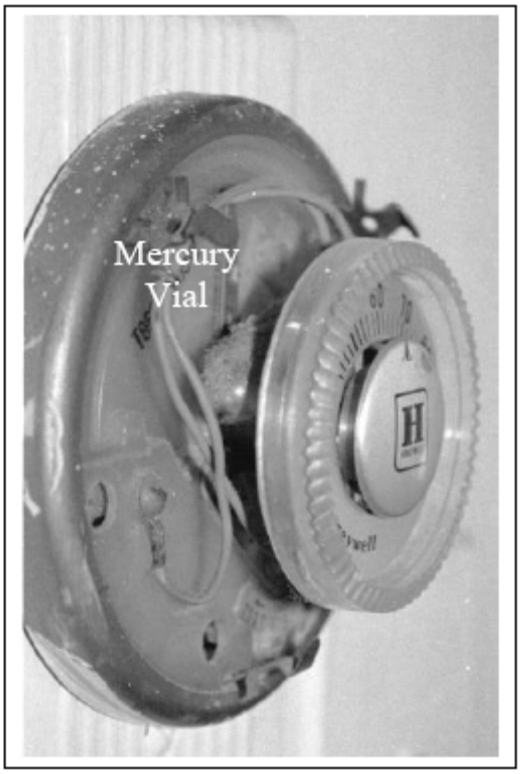
High Pressure Sodium HID Lamps High-pressure sodium lamps contain a small ceramic arc tube filled with xenon as a starting gas and a mercury and sodium amalgam. High-pressure sodium lamps produce a high quality light by passing an arc through sodium at high pressures. When starting, these lamps go through several phases in color as excess sodium amalgam stored in a reservoir vaporizes. In general, high-pressure sodium lamps have the best efficiency of any light source, very long life, warm color, and can be burned in any position. Applications include floodlights, industrial facilities, and roadways.

Building Component Database: HID Lamps
Hazardous Chemical: Mercury
Average Amount: 20-250 mg
Mercury Location: Inner ceramic or quartz arc tube
Average Life Expectancy: 8,000-24,000 hrs.
Lamp Location: Parking lots, street lights, and other outdoor applications
Regulated under: RCRA, various state regulations
Major Manufacturers: General Electric, Philips, Sylvania
Types: Metal Halide, High-Pressure Sodium, Mercury
Health Effects: Deterioration of nervous system and brain. Birth defects and death .

Various Configurations of High Intensity Discharge Lamps

FACT SHEET: Mercury Thermostats

How They Work Mercury thermostats are used for temperature control and are found in almost any type of building. Thermostats are triggered by a bi-metal element that expands or contracts with changing temperature. When the temperature increases or decreases the bi-metal element moves a glass ampoule filled with mercury. Mercury thermostats are designed such that the ampoules can be aligned in a position corresponding to a given temperature. Depending on the ampoule's orientation, the mercury inside will complete or break a circuit, causing the heating or cooling unit to operate.



Types of Thermostats There are three major types of thermostats. The standard manual thermostat has a manually adjusted set point. The set back thermostat is programmable and will automatically drop the set point for you. The auto changeover thermostat has two temperature settings and will automatically switch from heating to cooling to maintain a temperature range.

The number of ampoules of mercury found in a thermostat depends on the number of stages the thermostat has for heating and cooling. It is common to find thermostats with one, two or four ampoules of mercury. Mercury thermostats are found in the shape of either a rectangle or a circle. While thermostats that do not contain mercury are available today, mercury thermostats are still commonly used because of their relatively low cost and excellent performance and longevity.

Building Component Database: Mercury Thermostats

Hazardous Chemical: Mercury (Hg)

Average Amount: 1.5 to 2 g

Mercury Location: Ampule

Average Life Expectancy: 20 yrs.

Thermostat Location: Mounted on walls of many modern buildings

Regulated under: RCRA, various state regulations

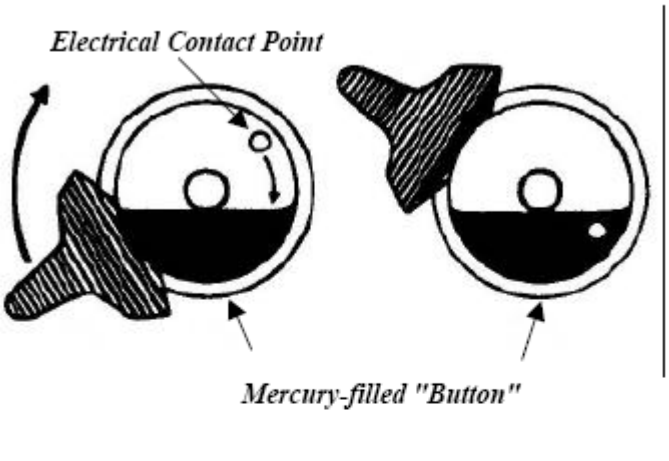
Major Manufacturers: Honeywell, Luxaire, White-Rogers

Types: Set-back, auto-changeover, multiple stage

Health Effects: Deterioration of nervous system and brain. Birth defects and death

FACT SHEET: Mercury Switches

Mercury Light Switches Mercury light switches are sometimes encountered in older buildings. These devices look like typical wall switches, but they do not make the audible "click" sound when activated. They operate on the principal of liquid mercury in a metal encased glass button that completes the electrical circuit when the switch is lifted up, submerging an electrical contact point. These switches are often referred to as "silent switches," although other non-mercury switches on the market today are also sometimes referred to as silent.



Principle of Mercury Wall Switch Operation

General Electric manufactured the buttons for mercury wall switches until the late 1980's. The switches were distributed by Leviton. These switches had the advantage of silent operation and very long operating lifetimes. The mercury-containing buttons can not be broken without the application of excessive force.

Building Component Database: Mercury Wall Switches

Hazardous Chemical: Mercury

Average Amount: 2-3 eyedrops

Mercury Location: Stainless steel cup or "button"

Average Life Expectancy: 50+ yrs.

Switch Location: Mounted on walls near doors and walkways

Regulated under: RCRA, various state regulations

Major Manufacturers: General Electric, Levitan

Health Effects: Deterioration of nervous system and brain. Birth defects and death

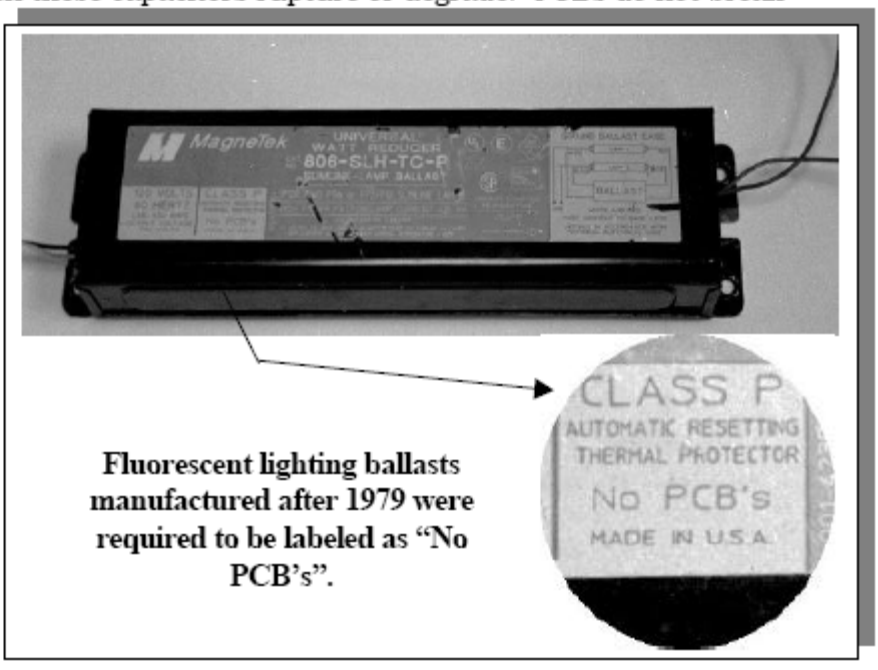
Mercury Displacement Relays and Contacts Some mechanical relays and contacts use mercury as a contacting element. These types of switches are quieter and avoid fatigue better than their non-mercury counterparts. The mercury is found in a hermetically sealed container within the relay or contactor. These devices are typically found in furnace controls, light and traffic controls, lab equipment, high voltage industrial equipment, and motors.

FACT SHEET: Lighting Ballasts

What is a Ballast? Fluorescent and HID lighting requires a special electrical device known as a ballast. The purpose of a ballast is to generate an initial voltage to start the arc on fluorescent and HID lamps and to regulate the amount of current these lamps receive. There are three major types of ballasts; the electromagnetic (magnetic), the electronic, and the high intensity discharge (HID). In addition, an emergency ballast containing nickel-cadmium batteries is often found connected to a single ballast or a series of ballasts. More information about Ni-Cd batteries can be found in another fact sheet.

Components The specific components and configurations differ for each type of ballast. In general, a ballast can contain a capacitor, an igniter, a coil, and potting compounds. The coil is a type of transformer that converts line voltage to usable lamp voltage. The capacitor is used to correct the "dirty" harmonics associated with ballast operation and is either oil filled or dry film. The oil filled capacitor is filled with a dielectric fluid which, before 1979, consisted largely of polychlorinated biphenyls (PCBs). Metal film capacitors contain no dielectric and instead use a polyester or metalized film. Potting compounds are asphalt-based compounds or polyester resins used for noise suppression and heat dissipation. The igniter is used for the initial startup voltage necessary to run the lamps.

Ballasts Containing PCBs Some ballasts contain a mixture of chemicals called polychlorinated biphenyls (PCBs). PCBs are oily fluids that range in color from pale yellow to clear. For 60 years, PCBs were used as dielectric fluids in transistors, capacitors, and heat transfer equipment. They are found in the capacitors of some ballasts and make their way into the environment when these capacitors rupture or degrade. PCBs do not break down in the environment and may bioaccumulate in the food chain. In 1979, the Toxic Substances Control Act officially banned the manufacture of PCBs. However, PCBs still present a threat. In 1971, EPA regulation 40 CFR 761 allowed PCB-containing ballasts already in use to remain in use. Ballasts are replaced only through retrofitting projects such as the EPA's Green Lights Program or when ballast failure occurs. But since ballasts can operate about 30 years before failure, many PCB-ballasts are still in use today.



Fluorescent lighting ballasts manufactured after 1979 were required to be labeled as "No PCB's".

DEHP Current ballasts use a number of chemicals in place of PCBs. The dielectric fluids in today's ballasts are mixtures of vegetable oils or DEHP (bis(2-ethylhexyl)ester di(2-ethylhexyl)phthalate). Research has shown that DEHP has the potential to increase human

health risk and is a possible carcinogen. Although several states do not regulate DEHP, some have banned DEHP ballasts from landfills.

Electromagnetic ballasts, also referred to as magnetic ballasts, are the most commonly found ballast for fluorescent light fixtures. Electromagnetics use a dry film or oil filled capacitor and two small coils for initial voltage and current regulation. An asphalt based potting compound covers the inside of the ballast can. The potting compound can be close to fifty percent by weight of the electromagnetic ballast. The ***electronic ballast*** is lighter, quieter, and operates more efficiently than the conventional magnetic ballasts. Electronic ballasts contain a dry film or oil filled capacitor and over one hundred solid state components that are used together for initial voltage generation and current regulation. The inside of an electronic ballast is completely filled with an asphalt based potting compound. Potting compounds of both magnetic and electronic ballasts sometimes contain small amounts of the chemicals found in the capacitor, including PCBs and DEHP.

Ballasts for **High Intensity Discharge** (HID) lamps operate on the same principal as the electromagnetic ballast. In general, HID ballasts use a core and coil, an oil filled or dry film capacitor, and an igniter to produce an initial voltage and to regulate current during operation. There are six major configurations for HID ballasts. HID lighting fixtures are often of the core and coil type. The **core and coil** uses several coils that are vacuum impregnated or dipped with a polyester varnish. The coils are located separately from the capacitor and igniter. The second type of configuration is the **potted core and coil**. A potted core and coil is the same as a standard core and coil except that the coil is placed in a can and potted with polyester resin. The **outdoor weatherproof** HID ballast configuration is used for remote outdoor locations. In the outdoor weatherproof, the core and coil, capacitor, and igniter are placed in an aluminum container and potted with a polyester resin. The **postline** configuration is usually mounted in lighting posts. In this configuration, the igniter and capacitor are located next to a core and coil potted with polyester resin. The fifth type of configuration is the **indoor enclosed** found near the ceilings of factories. In the indoor enclosed, the polyester resin potted core and coil is located in a different compartment than the igniter and capacitor. The last configuration, the **fluorescent can**, looks the same as ballasts encountered with fluorescent lighting units and is found in commercial and institutional buildings. The capacitor, igniter, and core and coil of a fluorescent can are potted with an asphalt-based compound.

Building Component Database: PCB Lighting Ballasts
Hazardous Chemical: Polychlorinated biphenyls (PCBs)
Average Amount: 30 g
PCB Location: Capacitor
Average Life Expectancy: 30 yrs.
Ballast Location: Inside fluorescent and HID lighting fixtures
Regulated under: TSCA, CERCLA
Major Manufacturers: Advance, General Electric, Magnetek, Universal
Types: Magnetic, electronic, HID, emergency lighting
Health Effects: Can harm reproduction and growth and has the potential to cause cancer

FACT SHEET: Batteries in Building Components

Where are batteries encountered? Batteries are encountered in a number of locations in buildings. Exit signs that illuminate in the event of a power failure are required in most buildings for safe evacuation. In buildings not equipped with an emergency power generator, this necessitates the use of a rechargeable battery connected to the exit sign. Under normal conditions, the exit sign will illuminate from the building's power supply, which also keeps the battery charged. The battery supplies the power when the building's power is down. Exit signs are placed in buildings according to building and fire safety codes.

Emergency lights operate in a similar fashion to exit signs except that they are not illuminated during normal operation. Fluorescent lamps have central battery ballasts, which keep the lamps lit in a power failure.

Not all emergency lights and exits signs operate on rechargeable batteries in the event of a power failure. In some cases, a generator will supply the power. One can tell whether batteries provide emergency power for exit signs and lights by simply looking for an attached box that houses the battery and other circuitry, or by looking for a test button. This denotes that it contains a battery. Other devices that contain batteries include alarm systems and smoke alarms.

Types of Batteries A number of different battery types have found use in modern society, including carbon-zinc, mercury, and alkaline. The batteries most often encountered as back up power supplies in building components are small sealed lead-acid (SSLA) batteries and nickel-cadmium (ni-cd) batteries. Each type of battery is described in more detail below.

Nickel-Cadmium Ni-cd batteries are popular and have a number of advantages including their light weight, durability, long life, and low maintenance. They can last from 2 to 4 times longer than lead acid batteries. Ni-cd batteries are typically 5 to 10 times more expensive than lead acid batteries. Sealed ni-cds were first developed in the 1950's from vented or wet ni-cds. Since then, they have gained much popularity, particularly for use in portable devices such as phones and computers.

Ni-cds are a source of particular concern for the health and environment because cadmium is highly carcinogenic. Cadmium can cause kidney damage when contaminated groundwater is ingested. An environmentally friendly substitute for ni-cd batteries is nickel-metal-hydride batteries. These batteries are not always an acceptable substitutes due to performance characteristics and expense. Ni-cd batteries are used in about 30% of emergency lights that use batteries. In 1991, ni-cd batteries only made up 0.1% of the U.S. waste stream by weight, but they represented 54% of the cadmium. Ni-cd's are composed of 13 to 15% of cadmium and 20 to 30% of nickel by weight.

Building Component Database: Nickel Cadmium Batteries

Hazardous Chemical: Cadmium (Cd)

Average Amount: 13 to 15 % by Weight

Cadmium Location: In batteries of exit signs or central alarm boxes.

Average Life Expectancy: 3 to 5 years inactive and 90 minutes discharging.

Sign Location: Stairways, ramps, escalators, and passage ways or closets and utility rooms.

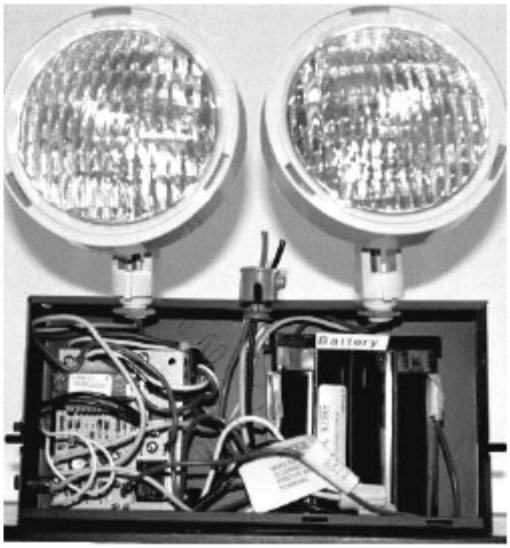
Regulated under: National Electrical Code (NEC) National Fire Protection Association (NFPA).

Major Manufacturers: Alcad, Crucial, Power Sonic, Saft, Panasonic.

Types: Sealed-nickel cadmium and wet nickel cadmium.

Health Effects: Can harm reproduction and growth and has the potential to cause cancer

Lead Acid Batteries Lead acid batteries have been used for over a century. They were first introduced in 1860. Lead acid batteries account for about 60% of the sales of all batteries in the world. The lead acid battery is generally the least-expensive battery for any application with regard to its performance and life characteristics. When compared, both lead acid and ni-cd batteries have the same energy density. However, rechargeable lead acid batteries have a shorter life and poorer cycling service. Because it is inexpensive, the lead acid battery is manufactured in a number of sizes and designs for numerous applications. The type of lead acid battery commonly used for emergency lighting is the portable sealed or non-spill lead acid, otherwise known as small sealed lead acid batteries (SSLA). Lead is used in about 70% of emergency lights that are powered by batteries. Approximately 65% of the battery's weight is lead or lead components. Batteries represent most of the lead use in the world. About 90% of lead batteries sold in the U.S. are recycled.



Emergency Lighting Unit
with SSLA Battery

Building Component Database: Lead Acid Batteries

Hazardous Chemical: Lead (Pb)

Average Amount: 70 % by Weight

Lead Location: In battery of sign or central alarm box.

Average Life Expectancy: 3 to 5 years inactive and 90 minutes discharging.

Sign Location: Stairways, ramps, escalators and passage ways leading to an exit or closets and utility rooms for alarm systems.

Regulated under: National Electrical Code (NEC) National Fire Protection Association (NFPA).

Major Manufacturers: Power Sonic Corp, Saft, Crucial, Panasonic

Types: Seal lead acid and Wet lead acid.

Health Effects: Brain and Nerve damage, stunted growth and kidney damage

FACT SHEET: Lead Roof Flashing

Lead Roof Flashing

Cleanout lines to plumbing systems in modern buildings are typically encountered on the roof. A flashing is typically placed around each pipe to provide a seal and support. The most common type of flashing is composed of lead. Lead flashings have the advantage of being extremely malleable and thus may be installed with ease on sloped surfaces. Lead is also preferred because of its strength and its resistance to atmospheric weathering.

The durable and maleable properties of lead make it an excellent material for protecting and sealing pipes and vents on roofs.

Lead vent flashings are manufactured to fit pipe diameters from 2 to 3 inches and to weigh approximately 5 to 7 pounds. The flashing are composed entirely of lead. The base of the flashing is placed underneath the roof tile or asphalt pitch. The top of the flashing is molded to fit around the opening of the pipe. Roofers prefer the lead "boot" flashing because of its resistance to corrosion and its durability. Other types flashings such as plastic and aluminum are available; however, they cannot compete with lead when durability and efficiency are concerned.

FACT SHEET: Lead Paint and Other Items

As of October 29, 1992, The Lead Exposure Reduction Act provided limits on lead in paint. Paint with less than or equal 1.0 mg/cm^2 or 0.5 % by weight is considered to be lead free. Lead base paint used in older buildings can have a lead content of up to 3.1 %. While the purpose of this document is not to provide guidance for the removal of lead from all painted surfaces, certain components of buildings may contain lead paint and may be easily removed. Such items include doorframes and windowsills.

To determine whether or not easily removable items of a building are coated with lead based paint, test kits may be used. Most large hardware supply stores sell lead paint test kits that are normally located in the safety or paint sections. The average price is about $12.00.

Another item containing lead that may be encountered in older buildings is lead pipe. Often, large amounts of lead pipe in a building make its removal economically valuable, above and beyond the environmental value associated with the removal.

REGULATORY REQUIREMENTS

Since 1965, Congress has passed several laws that establish rules for solid and hazardous waste. The Environmental Protection Agency (EPA) is the federal agency in charge of developing these rules. Some states have the authority to write separate, stricter rules in lieu of EPA rules.

Solid Waste Regulations

The first law to address solid waste was the Solid Waste Disposal Act of 1965. This law authorized guidelines for the disposal of solid waste. In 1970, the Resource Conservation and Recovery Act (RCRA) amended the Solid Waste Disposal Act (SWDA) to emphasize recycling and reuse as solid waste management goals. RCRA is the legal basis for today's solid waste management system. It promulgated rules for solid waste storage, treatment, and disposal. Most of the states' solid waste management plans are based on RCRA principles

Hazardous Waste Regulations

RCRA is the major body of law for hazardous waste management. RCRA defines hazardous waste and addresses its generation, storage, treatment, and disposal. Other laws that deal with hazardous waste are the Toxic Substances Control Act (TSCA) and the Comprehensive Environmental Response Compensation and Liability Act (CERCLA), also known as Superfund.

Regulations for Demolition Waste

Almost every demolition project generates hazardous waste. Demolition waste such as fluorescent lamps, PCB ballasts, lead-acid and ni-dd batteries, mercury thermostats, and lead flashings have special case-by-case requirements for generation, storage, transportation, and disposal.

The federal laws that address demolition can be found in RCRA, TSCA, the Universal Waste Rule, and CERCLA.

RCRA

RCRA defines hazardous waste and addresses its generation, storage, treatment, and disposal. Most states have adopted many of RCRA's rules for hazardous waste found in 40 CFR Parts 260-299.

Before disposing of any demolition waste, demolition contractors must determine if their waste is hazardous. A waste can be a characteristic or listed hazardous waste as defined in 40 CFR Part 261. According to RCRA, characteristic hazardous waste is waste that demonstrates at least one of the properties of ignitability, corrosivity, reactivity, or toxicity. A waste can also be a "listed" hazardous waste subject to the full RCRA regulations. The list is found in in 40 CFR Part 261.

Once contractors determine if they are dealing with a hazardous waste, they must determine what type of handler they are. Demolition contractors who remove hazardous materials for disposal are hazardous waste generators. The rules for hazardous waste generators are found in 40 CFR Part 262.

If the demolition contractor ships the waste for disposal the contractor is a hazardous waste transporter. Rules for hazardous waste transporters are found in 40 CFR Part 263.

TSCA

PCB ballasts are regulated by the Toxic Substances Control Act (TSCA) which can be found in 40 CFR Part 261. TSCA addresses the transportation, disposal, and spill clean-up of PCB containing ballasts.

CERCLA

The Comprehensive Environmental Response Compensation and Liability Act (CERCLA) also known as Superfund is the major body of law that addresses clean-up of hazardous waste sites. Under CERCLA, contractors who dispose of hazardous waste may be subject to notification requirements and future liability for hazardous wastes they dispose of.

Universal Waste Rule

The Universal Waste Rule (UWR) was enacted to encourage the collection and recycling of certain hazardous wastes generated in small quantities by a large number of diverse generators. The UWR allows demolition contractors to follow less stringent rules for record keeping, labeling, transporting, and storing hazardous waste batteries, pesticides, and mercury thermostats. Individual states can add other wastes to this list if EPA gives approval.

Conditionally Exempt Small Quantity Generators

It is important for demolition contractors to determine what hazardous waste generator category they fall under. Generators of small amounts of hazardous waste are not subject to the full RCRA hazardous waste regulations. The Conditionally Exempt Small Quantity Generator (CESQG) rule allows generators of 100 kg per month of hazardous waste or less to be exempted from 40 CFR parts 262-266, 268, 270, and 124. It is up to the demolition contractor to determine whether or not they fall under this category.

Responsibility of Demolition Contractor

The responsibility of determining what regulations must be followed falls to the generator of the waste, in this case, the demolition contractor. The hazardous building components discussed in this guide all will likely be hazardous waste if tested by the appropriate regulatory procedure. The most responsible action is therefore to manage all such materials removed from a structure as a hazardous waste.

Every state has a designated regulatory agency responsible for the management of solid and hazardous waste. These programs typically provide guidance in regard to the required management practices. A detailed review of all such requirements is beyond the scope of this guide. A list of state solid and hazardous waste contacts is provided as an appendix, and these organizations should be contacted for additional information.

Identification And Removal Procedures for Fluorescent Light Bulbs

Identification

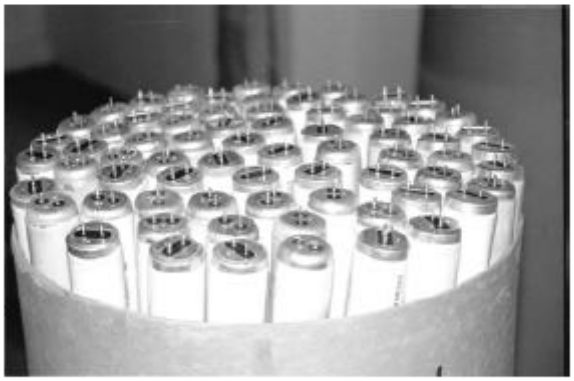
Fluorescent lights can be found in overhead-light fixtures and exit signs. Please see the fact sheet on fluorescent bulbs for the various types of bulbs encountered.

Removal

Most fluorescent bulbs require one of two techniques for removal:

- With the first technique the bulb is pushed in one direction against a spring located in the socket and then removed.
- With the second technique the bulb must be twisted from the socket.
- In the case of emergency exit signs containing compact-fluorescent bulbs, turn the bulb counter clockwise until fully unthreaded or released.
- Fluorescent bulbs are very delicate. Applying excessive force to the bulb may easily result in injury.
- Leather work gloves and a step ladder are recommended
- Bulbs should immediately be placed in boxes for disposal. Some mercury recyclers rent or provide cylindrical cardboard containers for safe transportation of fluorescent bulbs.
- A 15-inch diameter drum for eight-foot lamps holds between 80-90 fluorescent bulbs, while a 21-inch diameter drum for four-foot lamps holds between 160-170 bulbs.
- Average time to remove individual bulb is 60 seconds.

After removing the cover from the light fixture, straight fluorescent bulbs may be removed by twisting.



Bulbs should be stored in appropriate containers to prevent breakage. A cardboard shipping container may be obtained from lamp recyclers.

Disposal Options Arrange disposal with appropriate recycler. The responsible disposal option for fluorescent bulbs is recycling. Recycling protects human health and the environment and minimizes liability to the contractor.

Identification And Removal Procedures for High Intensity Discharge Lamps

Identification

Most HID lamps are used in security, outdoor, or warehouse applications. Probable locations are parking-lot light poles, warehouse rafters, and the outside walls of buildings.

Removal

HID lamps are usually screwed into a socket. The lamp may be removed by twisting it counterclockwise

- Leather work gloves and a step- ladder are recommended.
- Depending on the type of lighting unit and its installation, the removal may require screwdrivers, nutdrivers or wrenches.
- In many cases, the best way to remove HID lamps is to remove the entire lighting unit.
- Ballasts and batteries should be separated from the bulbs and placed in their respective containers.
- HID lamps should be placed in cardboard boxes wrapped in newspaper and/or cushioned with cardboard "peanuts."
- Designate a space solely for bulb storage to ensure the bulbs are not damaged prior to recycling.
- Removing the entire unit will also remove any ballasts or batteries, either lead-acid or ni-cd, which are present in the lighting unit.
- Average time to remove item is 90 seconds.

Disposal Options

Arrange disposal with appropriate recycler. The responsible disposal option for HID lamp bulbs is recycling. Recycling protects human health and the environment and minimizes liability to the contractor.

Remove cover to expose HID lamp

HID Bulb may be removed by unscrewing from fixture.
Note: Outdoor lighting unit will need to be removed to remove ballast.

Identification And Removal Procedures for Mercury Thermostats

Identification

Most thermostats have a removable front plate. This plate should be removed to determine whether or not the thermostat contains mercury.

A thermostat's mercury is contained in a glass vial less than 1 inch in length. While many thermostats contain only 1 of these vials, it is not uncommon to find 2 or 4 in a single thermostat.

Removal

- Once mercury is found in the thermostat, it is necessary to remove the whole thermostat.
- A screwdriver and a pair of wire cutters should be used to remove the thermostat without damaging it.
- Average time for removal is 60 seconds.
- If vials of mercury are removed from the thermostat instead of removing the whole unit (not recommended), these vials should be placed in plastic "ziplock" baggies prior to placing them in a container.

Disposal Options

1. Mercury thermostats and mercury ampoules can not be incinerated or disposed of in a city landfill.
2. Arrange disposal with an appropriate mercury recycler.

Identification And Removal Procedures for Mercury Switches

Identification

Light switches should be flipped to see if they "click." If they do not make a "click" noise, they may be silent switches. The only way to be sure is to remove switch and look at the actual mechanism. Relays and contacts are typically encountered in furnace controls, light and traffic controls, lab equipment, high voltage industrial equipment, and motors.

Removal

- Identify the word "TOP" stamped on the upper end of the silent switch by removing the cover plate. If present, then it is most likely a mercury switch.
- Remove the whole switch with screwdrivers and wire cutters and place in separate container.
- Average time to remove entire unit is 60 seconds.

Disposal Options

1. Mercury silent switches, mechanical switches and relays or contactors can not be incinerated or disposed in a city landfill.
2. Arrange disposal with an appropriate mercury recycler.

Identification And Removal Procedures for Batteries in Emergency Lights and Alarm Systems

Identification Wherever an emergency lighting unit, an exit sign, an alarm system, or a smoke detector is found, a battery is likely contained within.

An emergency light generally consists of two spotlights or lamps that are attached to a box, which houses the circuitry. This box is where the battery is located. Some emergency lights may be powered by a generator and do not contain any batteries.

For an alarm system, it is far more difficult to find the location of the battery. The plans of the building or the owner should be consulted. General locations are closets and utility rooms.

Smoke detectors are primarily found in residential housing or apartments attached to the ceiling or wall.

Removal

- Gloves, wire cutters, ladder, and other appropriate tools (a screwdriver or a wrench) will be required.
- Removal of the entire unit is recommended for safety. After the unit is safely accessible, remove the battery.
- Determine the type of battery.
- Use caution, batteries could be leaking.
- The general approach is to open the panel on the housing box using a screwdriver or wrench. Remove the wires from the battery by disconnecting leads or cutting wires.
- Average time to remove battery is 90 seconds.

Disposal Batteries may not be disposed of in a landfill. Arrangements should be made with an appropriate recycler to accept lead acid and ni-cd batteries.

Remove Panel Door Fasteners

Remove Panel Door

Remove Battery

Identification and Removal Procedures for Batteries in Exit Signs

Identification

The batteries encountered in an exit sign are located in either a housing box or in the sign itself. Note that some exit signs do not have emergency power batteries and typically will not have a box above the sign.

Removal

The exit sign can be removed from the ceiling or the wall in a number of ways.

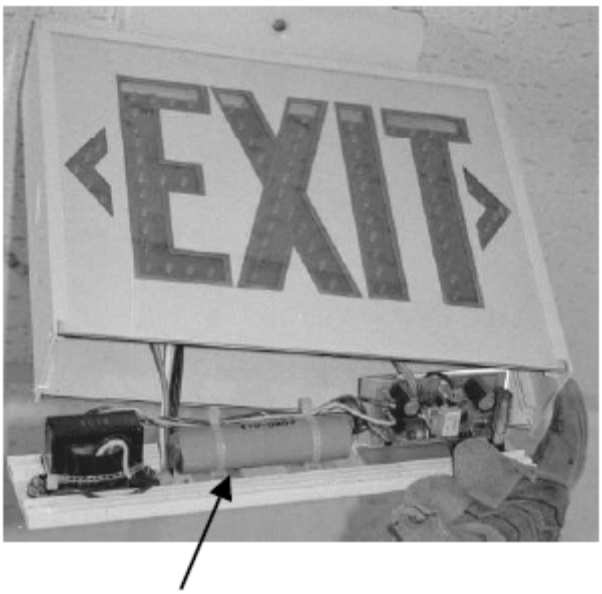
- One way to remove a sign attached to the ceiling, which is probably not so obvious, involves twisting the sign in a counter-clockwise motion—essentially unscrewing the sign from its holding and then clipping the wires.
- Other ways could involve using tools to loosen screws or bolts that hold the sign in place.
- Once the sign is down and wires are clipped, removing the battery is basically the same as for the emergency light.
- Approximate time to remove is 90 seconds.

Other Devices

Removing the face of the unit accesses smoke detector batteries. This is achieved by popping the face plate off or loosening screws. Then the battery can then be removed.

Disposal Options

Batteries may not be disposed of in a landfill. Arrangements should be made with an appropriate recycler to accept lead acid and ni-cd batteries.



Nickel Cadmium Battery Pack in Exit Sign

Identification And Removal Procedures for Lighting Ballasts

Identification Ballasts are rectangular shaped electrical boxes that are usually black in color. Fluorescent ballasts are located above or between the lamps in a fluorescent lighting fixture. Sometimes a metal plate must be removed to access them. HID ballasts can be found in HID lighting fixtures and light posts.

Since 1979, labeling requirements have been developed for ballasts and other PCB containing products. Through general agreement, the following guidelines should be used to determine whether a ballast contains PCBs:

1. All ballasts manufactured through 1979 contain PCBs.
2. Ballasts manufactured after 1979 that do not contain PCBs are labeled "No PCB's."
3. If a ballast is not labeled "No PCB's," assume it contains PCBs.

Removal The steps for removing a ballast include the following:

- Carefully remove the plastic lens from the bottom of the fixture. This can usually be accomplished by removing clips, unscrewing bolts, or unlocking pins. Lenses with hinges or chains can hang from the fixture. Otherwise, place the lens on the ground.
- Carefully remove the fluorescent bulbs and place them in a cardboard container for recycling. With the crowbar or power screwdriver, remove any plates covering the ballasts.
- Once the bulbs and plates are removed, use the power screwdriver to unscrew the ballast from the fixture. With the wire clippers in one hand and the ballast in the other, clip all the wires from the ballast. There are usually 3 wires leading to the ballast.

After removing bulb, remove ballast cover.

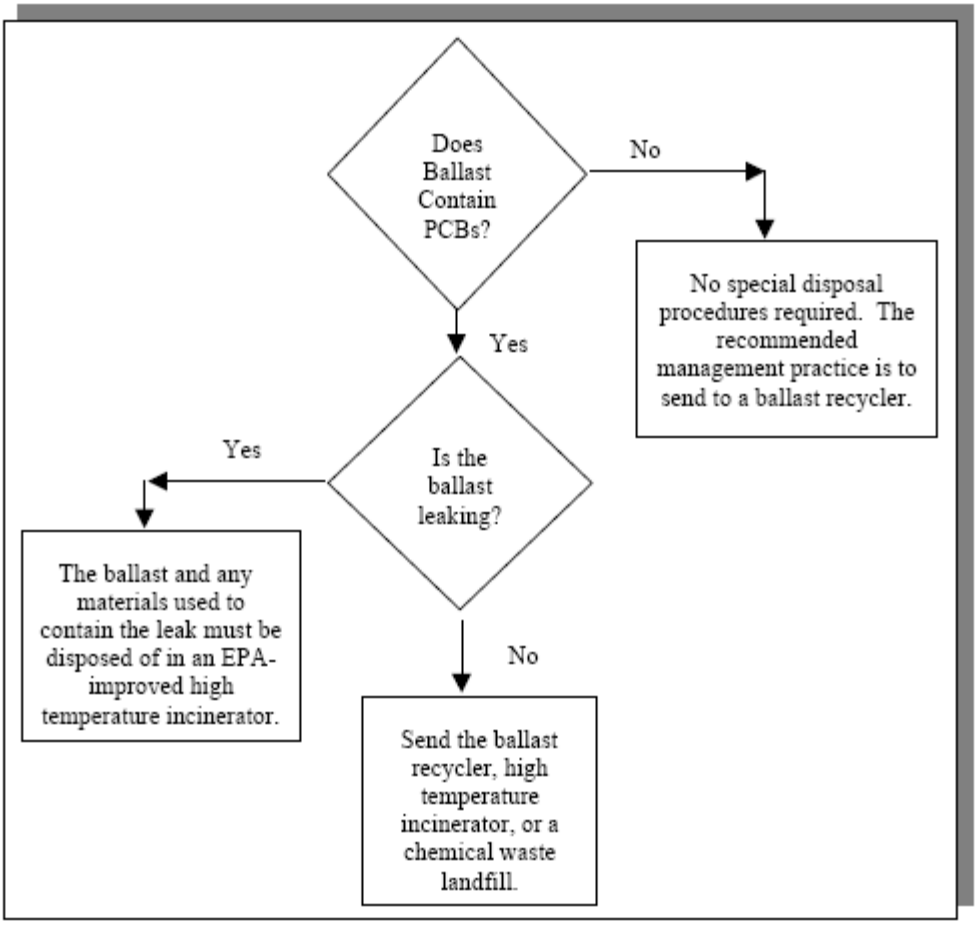
Remove restraining bolts.

Cut wires and remove ballast.

Store and dispose of properly.

- To remove HID ballasts, open the HID housing unit. If the HID ballast is composed of one unit, removal is the same as fluorescent ballasts. If the ballast components are separate, only the capacitor needs to be removed.
- Place the recovered ballasts in a 55-gallon steel drum. For disposal purposes separate the ballasts into drums for PCBs and "no PCBs" based on the identification procedure discussed earlier.
- Leaking PCB ballasts should be placed immediately in a heavy, plastic, zip-lock-type bag and handled as hazardous waste.
- An average of 30 seconds per fixture is required for ballast removal.
- PCBs are very harmful upon contact with skin and mucous membranes. Use caution.
- Safety equipment recommended by OSHA includes gloves made of neoprene, polyvinyl alcohol, FEP Teflon and Viton fluorocarbon rubber. These may be worn inside leather or cloth work gloves to prevent tearing or puncturing.

Disposal Disposal options for ballasts depend on the type, number, and condition of the ballast. Contractors should use the following procedures to determine the proper disposal of ballasts.



Identification And Removal Procedures for Lead Roof Vent Flashing

Identification Lead flashings are found on most roofs. Flashings are used to cover and protect exposed surfaces such as pipes. They look like a dull metal tube jutting vertically up from the roof.

Removal

- Lead flashings on flat, asphalt/gravel roofs require a little more than two minutes each to remove.
- Gravel must be cleared away from the base of the flashing using the claw of a hammer. Once most of the gravel is removed, the claw is used to hack away at the roof several inches away from the pipe.
- After a few hacks, the edge of the flashing base is found and can be pried away from the roof.
- Once the base of the flashing is removed from the roof, the claw of the hammer is used inside the pipe to detach the flashing from the pipe. The flashing can then be removed by hand.
- For the most part, flashings are removed from tiled roofs by the same process. However, tiled roofs require a utility knife to expose the flashing's base, plus a claw hammer to pry the base away from the roof.

Disposal Options Arrange disposal with appropriate lead recycler.

Identification And Removal Procedures for Lead Pipe

Identification Lead pipes can be found in commercial and residential buildings. Lead pipes are usually located behind walls, underneath floors, underneath workspaces, or above ceilings. It may not be possible to access all pipes, but those behind walls, workspaces, or those above ceilings can be accessed once thermostats, switches, lamps, and ballasts are removed.

Removal

- When removing pipes, avoid using a blowtorch or grinding wheel because these tools generate high amounts of dust.
- If these tools must be used, then respirators and eye protection should be worn by the operators and any personal located within the vicinity of the work, especially if the work place is not ventilated.
- Removing pipes normally generates high amounts of dust. This dust can be minimized if the surface can be moisten by a damp sponge or rag.

Disposal Options

Arrange disposal with appropriate recycler. State and local regulatory agencies should maintain lists of qualified recyclers.

Identification And Removal Procedures for Lead Paint

Identification

Lead paint hazards mainly pertain to paint chips and flakes. High amounts of lead paint can be found in homes painted before 1978 (also playgrounds). Major areas of concern are doors, doorframes, windows, window frames, and kick boards.

Lead-paint test kits are available in most hardware stores in the home safety section.

Removal

- Personnel should use eye protection and respirators during the entire paint removal and disposal phase.
- Remove doorframes and windowsills using a crowbar.
- Removable units (doors, window frames) can be removed and temporarily placed on a plastic sheet.
- The waste should stored in a separate container. This container needs to be sheltered from the elements so that rain will not leach out any lead into the ground water.

Disposal Options

Send doorframes and windows containing lead based paint to an appropriate disposal facility.

Conducting A Hazardous Material Removal Process

The aim of this chapter is to outline a procedure that may be used by a demolition contractor or inspector to systematically remove hazardous materials prior to demolition.

Pre-demolition Audit/Hazardous Materials Inventory

A pre-demolition audit is necessary to ensure all hazardous materials in a condemned structure are accounted for. The predemolition audit results in an organized list of hazardous materials, detailing what materials are present and where they may be found.

Walk Through Inspection

The pre-demolition audit begins with a walk through inspection of the building. Every room should be inspected, regardless of whether or not it is similar to another room. Rarely are two rooms exactly the same! Although they may look similar, they may be very different in hazardous material composition. Walk through inspections will vary in terms of the amount of time they require.

Take Good Notes

A sample of a predemolition audit form is included on the following page. The form should include a table that allows the number of each type of material to be recorded. The room these materials are found in should be noted. It is very important to allow additional space for comments. Many demolition sites will have rooms with unique arrangements or items not previously discovered. Sometimes, for example, a material with a unique installation will require special tools or personnel to remove it. Such discoveries should be noted, explicitly, in a predemolition audit. Omission of such information may result in that item not being removed from the waste stream or an improper removal procedure leading to injury or time delays.

Acquire Floor Plans

In addition to using forms to record items, floorplans are an invaluable tool for predemolition audits. Even rough notes on a floor plan can make the forms easier to follow since the plans explicitly detail where items are located. Some materials may be hidden in a location not adequately described by predemolition audit forms.

Take Inventory

As the demolition proceeds, the recovery of items should be noted. At the conclusion of the demolition, the number of uncovered items should be equal to the number of items detailed in the predemolition audit.

Timing is Important

The best way to perform a predemolition audit is to perform it as early as possible in the demolition project. If the building is vacant for any period of time, salvageable items such as thermostats and silent switches may be removed. Delicate items, such as fluorescent bulbs and HID lamps, may be vandalized. If the predemolition audit is performed too far along into the demolition, the chaotic nature of a demolition may prevent an accurate assessment of the materials present.

Removal Methods, Tools, and Removal Times for Hazardous Building Components

Item	Removal Method	Tools Needed	Container	Time per Item (sec)
Thermostats	Remove entire unit	Screwdriver	Small box Newspaper Styrofoam	30 to 60
Silent Switches	Remove entire unit	Screwdriver	Small box Newspaper Styrofoam	60 to 120
Fluorescent Bulbs	Remove bulb	Ladder	Cylindrical box Original package	20 to 30
HID Lamps	Remove entire unit	Ladder Screwdriver or nutdriver	Large box Newspaper Styrofoam	90 to 180
	Remove bulb only	Ladder	Small box Original container	45
Ballasts	Remove ballast	Ladder Nutdriver Wirecutter	55-gallon drum Large cardboard box	60 to 90
Batteries	Remove entire unit	Ladder Screwdriver or nutdriver	Large box Newspaper Styrofoam	90 to 180
	Remove battery only	Ladder Screwdriver or nutdriver Claw hammer or crowbar Wire Cutter	Large box	60
Lead Roof Flashings	Remove flashing	Ladder Claw hammer or crowbar	Large box	120

Impact on the Demolition Contractor

The benefits of removing hazardous building components from structures prior to demolition are many. The demolition contractor and the client greatly minimize future liability as a result of waste disposed from a demolition project. The materials recycled during demolition may retain a higher market value. Worker safety at the demolition and the disposal or recycling site is improved. The removal of chemicals such as lead, mercury, cadmium, and PCBs from demolition prevents their release into the environment.

Removal of hazardous building components is more expensive for the demolition contractor and therefore the client. Costs are incurred by the extra labor time required to remove the components. The previous table can be used to estimate the time for removal. Recyclers of items such as fluorescent lamps and batteries do charge for the items they accept and process. A range of process fees is presented in the following table.

Costs of Recycling Hazardous Building Components
(does not include transportation unless otherwise noted)

Item	Cost
Fluorescent Lamps	$0.06 to $0.13 per foot $0.25 to $0.40 per 4-ft lamp $0.50 to $1.00 per 8-ft lamp
HID Lamps	$2.00 to $4.50 per lamp
PCB Ballasts	$0.35 to $1.00 per pound (many companies differentiate PCB and non-PCB ballasts in price)
Mercury Thermostats and Switches	$3.00 to $4.00 per pound
Batteries	$2.50 to $10.00 per pound

Note: Prices vary per the quantity of items

Since the extra cost of removing these components will result in increased costs to the client, education as to the requirements and benefits outlined in this document may be needed. In addition to complying with necessary regulations, perhaps the largest benefit to the client is a greatly reduced liability for the waste that is generated. If demolition waste from a project is sent to a landfill and groundwater contamination results from chemicals in the waste, the demolition contractor *and* the client could be held financially responsible for any cleanup efforts undertaken.

Case Study 1: Lakewood Elementary, St. Petersburg, Florida

A demonstration project was conducted on Wednesday, July 16, 1997, at Lakewood Elementary School in St. Petersburg. The building, which was comprised of 15 classrooms, 4 restrooms and 2 utility/conference rooms, was being demolished by Standard Demolition, Inc., of Tampa. Six workers were needed to complete the job, which began at approximately 11 am and was finished by 5 PM (approximately 36 man-hours).

Walk Through The demonstration began with a walk-through inspection that lasted 30 minutes. Two workers inspected the upstairs while another pair inspected the downstairs. Because a floor plan was not available, both teams sketched a layout of the floor and documented where hazardous materials were located. In the future, it would be beneficial to acquire site plans prior to walk-through inspections, if available.

Removal of Fluorescent Bulbs and Ballasts

Removal of Small Sealed Lead Acid from Emergency Light

Removal Following the initial inspection, the 6 member team was divided into 3 groups of 2. Two teams removed fluorescent light bulbs and ballasts while the third team removed emergency lights and exit signs. The tools necessary to remove the materials were a Phillips head screwdriver, a nutdriver (ratchet attached to a nonmoving handle), a pair of wire cutters and a ladder. The screwdriver was used for the emergency/exit lights, while the nutdriver and wire cutters were used for the lights and ballasts. The team was not permitted to inspect the roof for lead flashings.

Analysis Lights required approximately 30 seconds each to remove, including the time required moving the ladder and become resituated. Ballasts also required about 30 seconds each for removal. Of the 245 ballasts that were removed from the school, only 9 of them contained PCBs. It appeared that the building's lighting had been redesigned in recent years since so few PCB ballasts were found. Furthermore, all PCB ballasts were found in only two rooms, neither of which appeared to be classrooms because of their extremely small size. Twelve of the ballasts were the emergency lighting type.

The following table summarizes the items recovered from Lakewood Elementary. No thermostats were found in the building, nor was any evidence found to suggest they had been removed.

Results of St. Petersburg Case Study

Component	Number Removed	Average Removal Time (sec)
Fluorescent Bulb	468	30
Ballast		
PCB	9	30
Non-PCB	233	30
Batteries		
Exit Signs	7	120
Emergency Lighting	10	120

Fluorescent Lights, Ballasts, and Batteries were Recycled by Quicksilver Environmental (Tampa, Florida)

Case Study 2: Rhines Hall, Gainesville, Florida

Rhines Hall was demolished by Beers Construction on October 7, 1997. The building was comprised of 64 classrooms and 4 restrooms. The removal was performed by two workers and took 6 hours.

Walk Through Floorplans for each of the building's three floors and roof were acquired from University Blueprint in Gainesville. Two workers took three hours to complete the pre-demolition audit. The number of fluorescent bulbs and ballasts in each room was counted and labeled on each floor's blueprint. Likewise, the location and number of batteries, HID lamps, and thermometers were also recorded.

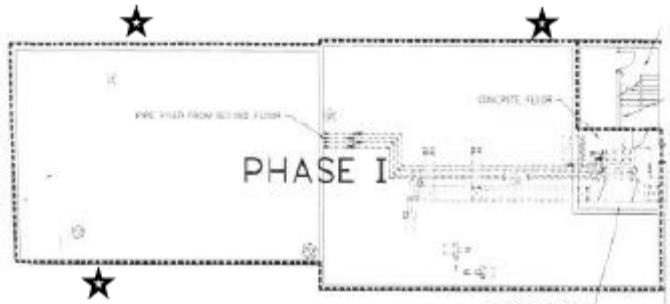
Removal Two workers performed the entire hazardous material removal. Each worker had a power screwdriver, a pair of wire cutters, and a ladder. The screwdriver was used for the emergency/exit lights, while the wire cutters were used for the lights and ballasts. The team did not inspect the roof for lead flashings.

Analysis Lights required approximately 30 seconds each to remove, including the time required to move the ladder and become resituated. Ballasts required about 90 seconds each for removal. Of the 420 ballasts that were removed from the building, only 12 of them contained PCBs. Neither the three HID bulbs nor the lead flashings were removed. The number of estimated fluorescent bulbs and ballasts may be low due to a dropped ceiling in some first floor rooms. Room 113, for example, had a renovated dropped ceiling and light fixtures from the original ceiling were above the tiles of the new ceiling. Some of these fixtures may have contained fluorescent bulbs and ballasts which were not removed at the time of renovation. This may explain the discrepancies between the number expected and the number removed. Further inspection was needed to warrant their inclusion in the pre-demolition audit.

The following table presents the results of the inspection and removal. Average Removal Time is based on data supplied from the demolition crew removing these items.

Hazardous Building Components Encountered and Average Removal Time

Component	Number Removed	Average Removal Time (sec)
Fluorescent Bulb	816	30
HID Lamp	3	180
Thermostat	1	30
Ballast	420	
PCB	12	90
Non-PCB	408	90
Batteries		
Exit Signs	9	90

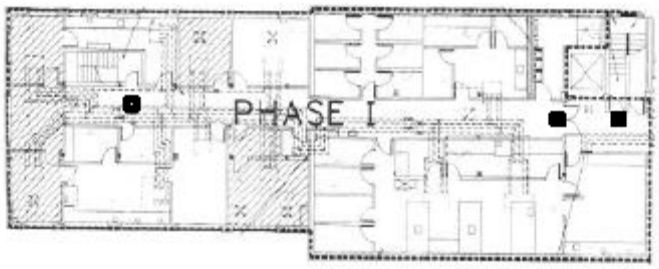


Roof

■ Exit Sign

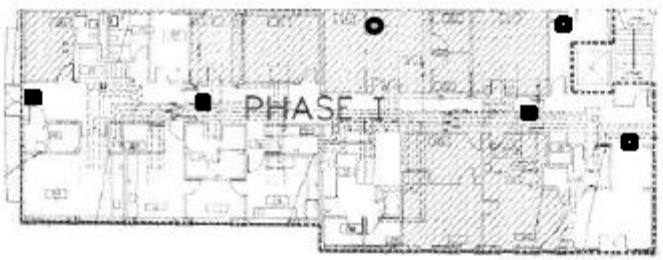
★ HID Light Fixture

● Mercury Thermostat



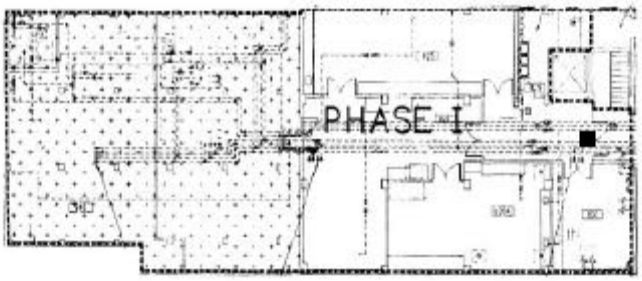
Second Floor

2nd Floor: 150 Light Fixtures
1st Floor: 148 Light Fixtures
Basement: 98 Light Fixtures



First Floor

Ballasts were stored in 55-gallon drums.



Basement

GLOSSARY

The following terms were used throughout this document.

Ballast Electrical device used to provide an initial starting charge required to excite the gaseous atoms and control the electric current going to fluorescent and HID lamps.

Bioaccumulation Process whereby certain chemicals concentrate to dangerous levels as they work their way up the food chain.

Cadmium A bluish white ductile toxic bivalent metallic element used especially in nickel-cadmium batteries which can cause liver damage, kidney failure and pulmonary disease.

Class III Landfill Classification of landfills in some states that can accept yard waste, construction demolition waste, and white goods.

Code of Federal Regulations (CFR) The location of federal regulations, including those relating to the management of solid and hazardous waste. For example, Title 40 of the Code of Federal Regulations Part 262 deals with requirements for generators of hazardous wastes.

Deconstruction Type of demolition that focuses on salvaging certain items for reuse.

Fluorescent Light Bulb Gas discharge bulb which emits light by passing electrical current though gaseous mercury.

High Intensity Discharge Lamp (HID) A dual chambered gas discharge bulb containing mercury which is used for outdoor lighting applications .

High Pressure Sodium Lamp Type of HID lamp with an inner ceramic tube and which uses a sodium/mercury amalgam. Emits a mono-chromatic light ideal for parking lots, bridges and street lights.

Leachate The liquid created as rainfall percolate through a solid waste. It may contain any chemical present in the waste materials. Leachate acts as a transport mechanism for the migration of chemicals from a landfill off-site.

Lead A heavy soft bluish white metallic element used especially in pipes, flashings batteries, and paints which may cause brain and nerve damage, stunted growth, and kidney damage.

Lead Acid Battery Type of battery with lead antimony electrodes and sulfuric acid electrolyte.

Lead Vent Flashing A malleable sheet or tube of lead used to help seal and protect exposed roof surfaces.

Materials Recovery Facility (MRF) A facility operated for the purpose of separating and recovering materials from a solid waste stream for recovery and reuse.

Mercury A heavy silver-white poisonous metallic element that is used in thermostats, switches, fluorescent and HID bulbs which can cause deterioration of the nervous system and brain damage, birth defects, and death.

Mercury Vapor Lamp Type of HID lamp with a mercury filled inner quartz arc tube used for indoor and outdoor lighting applications.

Metal Halide Lamp Type of HID lamp with a mercury filled inner quartz arc tube which emits a considerable amount of ultraviolet radiation.

Municipal Solid Waste All the waste generated from residential, commercial, and institutional facilities.

Nickel Cadmium Battery Type of light – weight, rechargeable, rapid discharge battery that uses nickel and cadmium.

Polychlorinated Biphenyls (PCBs) Oily chemicals used as lubricating fluids in the capacitors of some ballasts which can harm reproduction and growth and has the potential to cause cancer.

Resource Conservation and Recovery Act (RCRA) The federal statute that deals with the identification, generation, storage, treatment, and disposal of hazardous solid wastes.

Silent Switch A type of light switch which uses a mercury filled cylinder to make a quiet contact when turned on.

Spotter Municipal waste facility employee who inspects incoming loads of waste for prohibited materials.

Thermostat A temperature control device which uses mercury filled ampoules to trigger heating, ventilation, and air conditioning (HVAC) systems.

Universal Waste Rule Federal rule which allows demolition contractors to follow less stringent rules for record keeping, labeling, transporting, and storing hazardous waste batteries, pesticides, mercury lamps and mercury thermostats.

Appendix B **MANAGING SPENT FLUORESCENT and HIGH INTENSITY DISCHARGE (HID) LAMPS**

FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION

Managing Spent Fluorescent and High Intensity Discharge (HID) Lamps

A Fact Sheet For Florida Businesses and Government Facilities

Fluorescent or High Intensity Discharge (HID) lighting is a good business choice. Compared to incandescent lighting, fluorescent and HID lighting use less energy and produce less heat. Less energy and heat not only result in lower lighting and cooling costs, but they also result in utility power plants emitting less air pollutants such as mercury, lead, nitrogen oxides, and sulfur dioxides. If you are considering switching to high-efficiency fluorescent or HID lighting, don't hesitate to make the change.

Although fluorescent and HID lighting save energy and money, they do present special disposal considerations. Fluorescent and HID lamps (as well as some types of neon lamps) contain mercury and in most cases are considered to be hazardous wastes when disposed. Mercury is a toxic metal that in certain forms can accumulate in living tissue and cause adverse health effects. Although the amount of mercury in each lamp is small, several million lamps are discarded by Florida businesses each year, making these lamps one of the largest sources of mercury in our garbage. When a lamp is broken or placed in a landfill or incinerator, the mercury can contaminate the air, surface water, and ground water. Mercury contamination in Florida is most evident from the Department of Health's warnings of high mercury levels in fish in a number of our lakes and in the Everglades.

Because of this, these types of spent lamps, excluding those from households, containing any amount of mercury have been banned from solid waste incineration since July 1, 1994, in any quantity. Since most of these types of lamps contain hazardous levels of mercury, they should not be disposed of at solid waste landfills in Florida if more than 10 lamps per month are generated by a business from any one location. Local solid waste departments are the final authority for landfill disposal and may decide to refuse to accept any spent lamps from generators, regardless of the amount of mercury contained in the lamps, especially in those counties or municipalities that also operate solid waste incinerators.

Florida businesses and governmental facilities generating spent fluorescent and HID lamps ("Generators") have two options for managing them: either recycling or landfill disposal.

1) You are encouraged to recycle fluorescent and HID lamps, even those with lower mercury content, by following the Chapter 62-737, Florida Administrative Code regulations outlined in this fact sheet. Hazardous waste lamps destined for recycling and managed in accordance with these regulations are considered to be universal wastes in Florida and do not count toward your facility's hazardous waste generator status. Check with the receiving storage or recycling facility for its guidelines on packaging and transportation. A list of recycling facilities in Florida can be obtained by calling 1-800-741-4337. *RECYCLING IS THE RECOMMENDED MANAGEMENT OPTION FOR THESE LAMPS!*

2) (a) Generators of 10 or less spent lamps per month per location may dispose of these lamps with the regular trash going to a permitted, lined solid waste landfill. Low mercury, non-hazardous waste spent lamps may also be disposed of at permitted, lined solid waste landfills in any quantities. However, contact your local solid waste management department for any final guidance or restrictions on the landfill disposal of these lamps.

(b) If more than 10 spent hazardous waste lamps are generated per month, they may be disposed of at a permitted hazardous waste landfill and would count toward your facility's hazardous waste generator status.

RECYCLING REQUIREMENTS AND GUIDELINES (Continued on Back)

Generator Requirements (Continued on Back)

- Does not place used lamps from business, industry, or institutions in the regular trash.
- Stores lamps in an area and in a manner that will prevent them from breaking. *Does not stuff too many or too few lamps into the shipping container. Recycling facilities request that you do not tape lamps together for storage or shipment and may not accept lamps that are taped together.*
- Labels the lamps or each container as *"Spent Mercury-Containing Lamps for Recycling" or "Universal Waste Mercury Lamps", or "Waste (or Used) Mercury Lamps".*

- A business or institutional generator location may accumulate and store up to 5,000 kilograms of lamps (20,000 lamps) at any one time and for up to one year, *if the lamps are destined for recycling*, without being subject to notification requirements (EPA Form 8700-12)

- If lamps are accidentally broken, immediately contain the broken lamps and store them in a tightly sealed container. It is recommended that you mark the container as "*Broken Spent Mercury-Containing Lamps For Recycling*".

- Trains employees in proper lamp handling, packaging and emergency cleanup and containment procedures. Non-lamp residues containing mercury and that are generated as a result of a lamp cleanup are to be managed as hazardous waste.

- Do not intentionally break or crush lamps unless you are complying with the "*Drum-top Crushers" requirements below*.

- If on-site storage is not feasible, lamps may be transported to a central accumulation point at one of your own facilities, to a registered handler facility, or directly to a permitted recycling facility. If you transport your own lamps, you also need to comply with the Department's transporter regulations. *See the Transportation Requirements and Transporter Requirements below*.

Drum-top Crusher Requirements (For *Generators* Only)

Most recycling facilities prefer unbroken lamps, and they may charge more to accept crushed lamps. Mercury may adhere to the drum, the container, or the metal end caps causing mercury contamination and increased costs for recycling or disposal especially under humid conditions or longer storage times. However, use of this equipment is allowed by a generator only per paragraph 62-737.400(6)(b), F.A.C., as long as the crushed lamps immediately enter the final accumulation container from the drum-top crusher equipment and crushing is done under the following conditions:

- Crushing poses employee health and environmental risks if mercury vapors are released. Releases of mercury vapors or other contaminants shall be prevented, and the user shall comply with all applicable OSHA standards.

- The crushing unit shall be properly maintained (e.g., adequate filter changes), operated per the manufacturer's written procedures, and the employees using this equipment shall be thoroughly familiar with these procedures.

Handler Facility (Non-generator Collection) Requirements

- Annually registers with the Department as a small or large quantity handler and receives or renews a DEP ID number.

- *A small quantity handler facility* accumulates up to 2,000 kilograms (8,000) of lamps indoors at any one time for no longer than one year.

- A *large quantity handler facility* accumulating 8,000 or more lamps at any one time must also register as such and submit to the Department: *a one-time $1,000 registration fee, an operational plan, and a closure plan including financial assurance.*

- Follow other requirements listed above for *Generators* except that crushing of lamps as described above is only allowed by generators without a permit.

Record Keeping Guidelines for Generators & Handlers

- Obtain and keep receipts for shipments of lamps off-site to show DEP and local inspectors that lamps were properly handled. Receipts should have the following information: the quantity of lamps shipped or received, the date of shipment or receipt, and the name and address of the handler or recycling facility receiving any shipped lamps.

- Records of receipts and shipments of lamps are required for large quantity handler facilities (including generators) and shall be kept for 3 years from the date of shipment or receipt

Reverse Distribution Program Requirements

- Sponsored by a lamp manufacturer or distributor (which may include a business distributing lamps to its facilities).

- Sponsor assumes responsibility for collection and recycling of spent lamps.

- Annually registers with the Department, receives/renews a DEP ID Number, and provides a program description including all participating transporters, handlers and recycling facilities.

Transportation Requirements

- When shipping lamps within Florida, a hazardous waste manifest and a licensed hazardous waste transporter are not required for shipments to a handler or recycling facility within Florida.

- When shipping out of Florida, follow the intermediate and receiving states' requirements.

- When shipping into Florida, you may use a shipping paper *unless* your state or an intermediate state requires a hazardous waste manifest; then you must follow those states' requirements.

Transporter/Transfer Facility Requirements

- Annually registers with the Department and receives or renews its DEP ID number as a transporter and/or transfer facility.

- Uses only totally enclosed trucks in good condition.

- If registered as a transfer facility, may store properly packaged lamps on a truck used in the actual transportation of lamps or at an indoor location for up to 10 days.

- Trains drivers in proper handling, packaging and emergency cleanup and containment procedures and keeps these procedures on the trucks.

- Complies with any applicable Department of Transportation (DOT) regulations, including the Hazardous Material Regulations.

Note: Transporters and handlers collecting lamps from generators of 10 or less lamps per month and who do not accumulate more than 100 kilograms (400 lamps) at one time are exempt from the annual registration requirements outlined above.

PCB and Other Light Ballasts

- Ballasts containing PCBs (polychlorinated biphenyls) cannot be disposed in Florida. Send to a processor for removal of PCB components and disposal at approved facilities outside of Florida. Non-PCB components may be managed and recycled in Florida.

- About 25% of non-PCB ballasts contain DEHP (di (2-ethylhexyl) phthalate) which is classified by EPA as a hazardous substance. Disposal of about 1600 of these ballasts would trigger the reportable quantity requirement under the federal Superfund laws. The Department recommends that ballasts of this type not be disposed of at solid waste landfills.

- The Department recommends the recycling of all discarded light ballasts.

For a list of recycling facilities or for further information or questions, contact the Florida Department of Environmental Protection's Hazardous Waste Management Section at: 1-800-741-4DEP (4337) or at www.dep.state.fl.us.

Revised June 1998

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Appendix C **MANAGING DISCARDED MERCURY-CONTAINING DEVICES (MCDs) in FLORIDA**

FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION

Managing Discarded Mercury-Containing Devices (MCDs) in Florida

A Fact Sheet For Florida Businesses and Government Agencies

Mercury-containing devices are electrical products or other devices, excluding batteries and lamps, that contain mercury as a necessary component for their operation. Some examples include mercury thermostats, thermometers, electric switches and relays, marine float switches and manometers. Due to the decline of mercury use in batteries and lamps and the larger quantities of this toxic heavy metal found in these products, mercury-containing devices are expected to be the largest source of mercury in municipal solid waste by the year 2000.

Mercury-containing devices do present special disposal considerations due to the quantity of mercury they contain and since they are usually considered to be hazardous wastes when disposed of. The amount of mercury in a device is relatively large. For example, a thermostat can contain as much mercury as 75-100 fluorescent or other mercury-containing lamps. Mercury is a toxic metal that in its various forms can accumulate in living tissue and cause adverse health effects. When a device is broken and is disposed of in a solid waste landfill or incinerator, the mercury can contaminate the air, surface water, and ground water. Mercury contamination in Florida is most evident from the Department of Health's warnings of high mercury levels in fish in a number of our lakes and in the Everglades.

Because of this, these types of devices, including those from households, have been banned from disposal at solid waste facilities, including landfills and incinerators, since January 1, 1996, in any quantity.

Florida businesses and other generators discarding mercury-containing devices ("Generators") have two options for managing them: either recycling or hazardous waste disposal. For either of these options, if a pound of more of mercury is contained in a shipment container (e.g., a little more that 100 mercury thermostats would contain this much mercury), the generator will need to ship the devices in accordance with the US DOT Hazardous Material Regulations.

1) You are encouraged to recycle mercury-containing devices by following the Chapter 62-737, Florida Administrative Code regulations outlined on the back of this fact sheet. Devices destined for recycling and managed in accordance with these regulations are considered to be universal wastes in Florida and do not count toward your facility's hazardous waste generator status. In addition to the following requirements and guidelines, check with the receiving storage or recycling facility for its guidelines on packaging and transportation. A list of recycling facilities in Florida can be obtained by calling 1-800-741-4337. *RECYCLING IS THE RECOMMENDED MANAGEMENT OPTION FOR THESE DEVICES!*

2) Mercury-containing devices may be managed at permitted hazardous waste treatment and disposal facilities and would count toward your facility's hazardous waste generator status. Before they can be disposed of at a hazardous waste landfill, however, they will need to be shipped and treated at a permitted hazardous waste facility (e.g., a mercury recovery/reclamation facility) to remove most of the mercury in accordance with the EPA's land disposal restriction regulations.

MERCURY-CONTAINING DEVICE RECYCLING REQUIREMENTS & GUIDELINES

Generator Requirements

- Does not place used devices from business, industry, or institutions in the regular trash.
- Stores devices in an area and in a manner that will prevent them from breaking. *Does not stuff too many or too few devices into the shipping container and use adequate cushioning material for packing.*
- Labels the devices or each container as *"Spent Mercury-Containing Devices for Recycling" or "Universal Waste Mercury Devices", or "Waste (or Used) Mercury Devices". For thermostats, substitutes "Thermostats" for "Devices" in the last two labeling categories.*
- If devices are accidentally broken, immediately contain the breakage and store them in a tightly sealed container. It is recommended that you mark the container as *"Spent Broken Mercury-Containing Devices For Recycling".*
- Trains employees in the proper device handling, packaging and emergency cleanup and containment procedures. Non-device residues containing mercury and that are generated as a result of a device cleanup are to be managed as hazardous waste.
- Does not intentionally break, treat or dispose of devices.
- If on-site storage is not feasible, devices may be transported to a central accumulation point at one of your own facilities, to a registered handler facility, or directly to a permitted recycling facility. If you transport your own devices, you also need to comply with the Department's transporter regulations. *See the Transportation Requirements and Transporter Requirements below.*

Handler Facility (Non-generator) Requirements

- Annually registers with the Department as a small or large quantity handler and receives or renews a DEP ID number.
- *Small quantity handler accumulates* up to 100 kilograms (220 pounds) of devices indoors at any one time for no longer than one year.
- A *large quantity handler facility* accumulating more than 220 pounds of devices at any one time must also register as such and submit to the Department: *a one-time $1,000 registration fee, an operational plan, and a closure plan including financial assurance.*
- Follows other requirements listed above for *Generators.*

Record Keeping Guidelines for Generators & Handlers

- Keep receipts for shipments of devices off-site to show DEP and local inspectors that devices were properly handled. Receipts should have the following information: the quantity of devices shipped or received, the date of shipment or receipt, and the name and address of the handler or recycling facility receiving the shipped devices.
- Records of receipts and shipments of devices are required for large quantity handler facilities (including generators) and shall be kept for 3 years from the date of shipment or receipt

Reverse Distribution Program Requirements

- Sponsored by a device manufacturer or distributor (which may include a business distributing devices to its facilities).
- Sponsor assumes responsibility for collection and recycling of discarded devices.
- Annual registration with the Department, receipt or renewal of a DEP ID Number, and submission of a program description including all participating transporters, handlers and recycling facilities.

Transportation Requirements

- When shipping devices within Florida, a hazardous waste manifest and a licensed hazardous waste transporter are not required for shipments to a handler or recycling facility within Florida in accordance with these requirements
- When shipping out of Florida, follow the intermediate and receiving states' requirements.
- When shipping into Florida, you may use a shipping paper *unless* your state or an intermediate state requires a hazardous waste manifest; then you must follow those states' requirements.

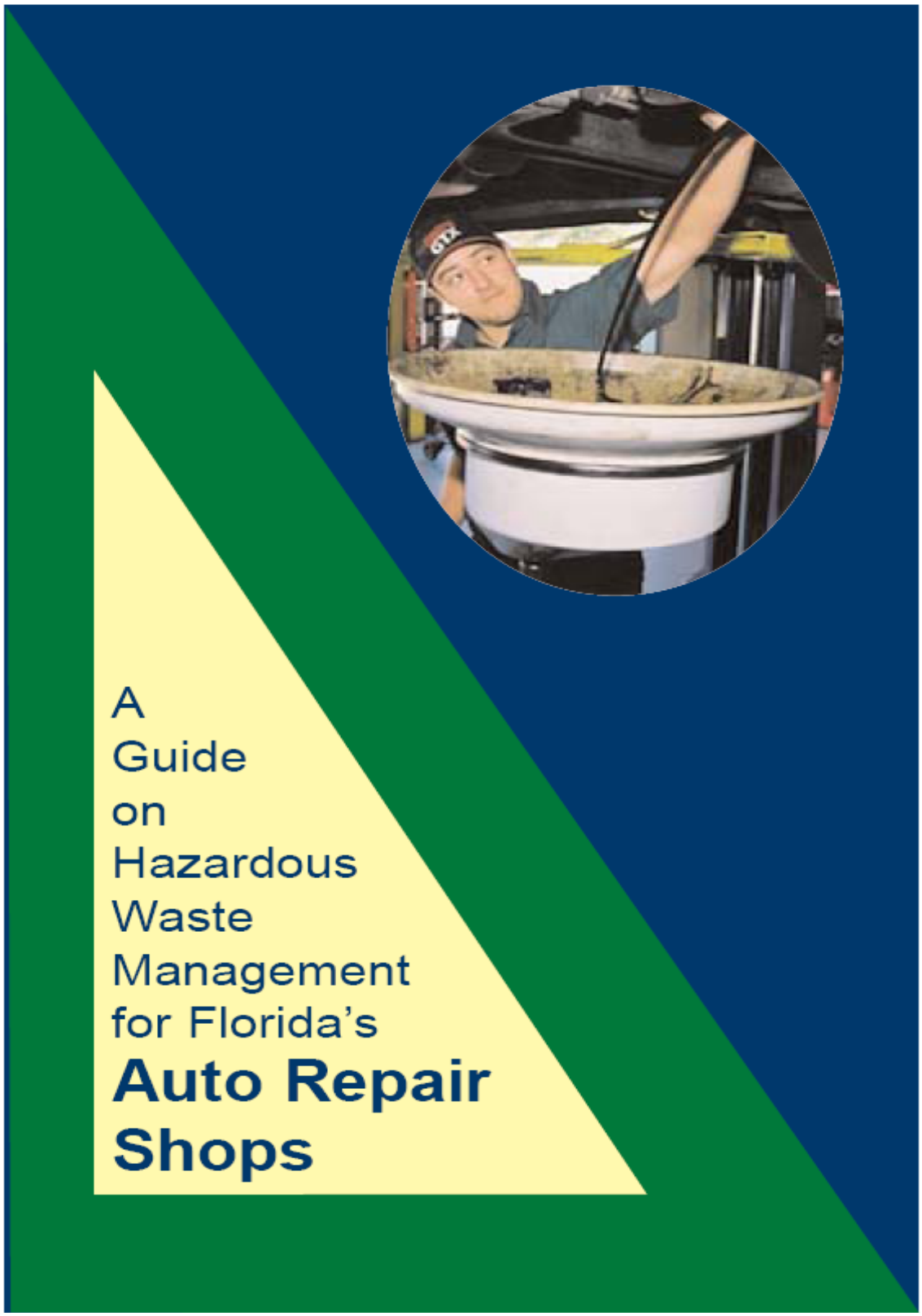
Transporter/Transfer Facility Requirements

- Annually registers with the Department and receives or renews its DEP ID number.
- Uses only totally enclosed trucks in good condition.
- May store properly packaged devices on the truck or at a another area of a registered transfer facility for up to 10 days.
- Trains drivers in proper handling, packaging and emergency cleanup and containment procedures & keeps these procedures on the trucks.
- Complies with any applicable Department of Transportation (DOT) regulations, including the Hazardous Material Regulations.

For a listing of recycling facilities or for further information or questions, contact the Florida Department of Environmental Protection's Hazardous Waste Management Section at:

1-800-741-4DEP (4337) or at its Internet website at www.dep.state.fl.us Revised May 1998

Appendix D **A GUIDE on HAZARDOUS WASTE MANAGEMENT for FLORIDA'S AUTO REPAIR SHOPS**



Florida Department of Environmental Protection Hazardous Waste Compliance Assistance Program

This document was published to help educate businesses on hazardous waste management issues affecting them. The suggested options may help businesses to operate in an environmentally appropriate manner. Some of the options may go beyond what is required to remain in compliance with regulations. Business owners are responsible for obtaining complete information about applicable regulations. Misrepresentations or omissions by the Florida Department of Environmental Protection or the Florida Center for Solid and Hazardous Waste Management do not relieve any person from any requirement of federal regulations or Florida law.

With Support From:

David Struhs, FDEP Secretary
Alan Bedwell, FDEP Deputy Secretary
John Ruddell, FDEP Waste Division Director
Bill Hinkley, FDEP Bureau Chief, Solid and Hazardous Waste Section
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Prepared by:

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Florida Center for Solid and Hazardous Waste Management
www.floridacenter.org
John Schert, Executive Director
Julie Lyons, Project Coordinator
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These regulations are available at many public libraries. In addition, the Florida Department of Environmental Protection and the United States Environmental Protection Agency have posted links to copies of these regulations on the agencies' Internet sites:

http://www.dep.state.fl.us
http://www.epa.gov

These sites also provide links to agency forms, fact sheets, checklists, rule summaries, answers to frequently asked questions and reports from our public information databases. Individuals who do not have Internet access may obtain copies of department publications through the contact information listed on page 16 of this document.

Revised 6/2002

Why should I care about hazardous wastes?

As a business owner, operator or employee, you may be producing materials that can harm people and the environment. This booklet offers helpful tips on how to:

- Comply with federal and state hazardous waste regulations.
- Avoid penalties by properly managing hazardous wastes.
- Save money on disposal costs by reducing hazardous wastes.

Health and Environment

Hazardous wastes spilled or dumped on the ground or disposed in dumpsters may seep into the groundwater and contaminate drinking water supplies.

Hazardous wastes may run off into the nearest body of water where they may poison or kill fish and other wildlife.

Hazardous wastes pose a risk to you, your employees and your community.

Cost Savings

State and county inspectors may visit your business to ensure that hazardous wastes are being managed properly. State penalties range from $100 to $50,000 **per violation per day**.

Reducing hazardous wastes can reduce your production and disposal costs and reduce your risk of future liability.

Public Image

Your customers will appreciate your efforts to prevent pollution.

Your community will recognize your business as a good neighbor.

What is a hazardous waste?

A waste is hazardous if:

- It is listed as a hazardous waste in the Title 40 Code of Federal Regulations (CFR) Part 261, Subpart D.
- It has any of the characteristics described below:

Characteristic Wastes

Ignitable

Ignitable wastes are flammable or spontaneously combustible. If they have a flashpoint of less than 140 degrees Fahrenheit or an alcohol content of 24% or more, they are hazardous wastes. Examples include some paints, paint solvents, other solvents and degreasers.

Corrosive

Corrosive wastes can burn the skin or corrode metals. Liquids with a pH of 2 or lower or 12.5 or higher are corrosive. Examples include rust removers, acidic or alkaline fluids and battery acid.

Reactive

Reactive wastes are unstable and may explode or react violently with water or other materials. Examples include explosives such as detonators for air bags, cyanides and reactive peroxides including some catalysts.

Toxic

Wastes are toxic if they contain certain heavy metals above specific concentrations, such as chromium, lead or cadmium, or toxic organic chemicals. Examples include some parts cleaners, mercury switches, chromium-bearing paints and spray booth filters.

Listed Wastes

Some industrial processes and chemical wastes are listed specifically as hazardous in the federal regulations under 40 CFR 261, Subpart D. Copies of the rule can be found at many public libraries, on the Internet or may be purchased from the Government Printing Office.

Acutely Hazardous Wastes

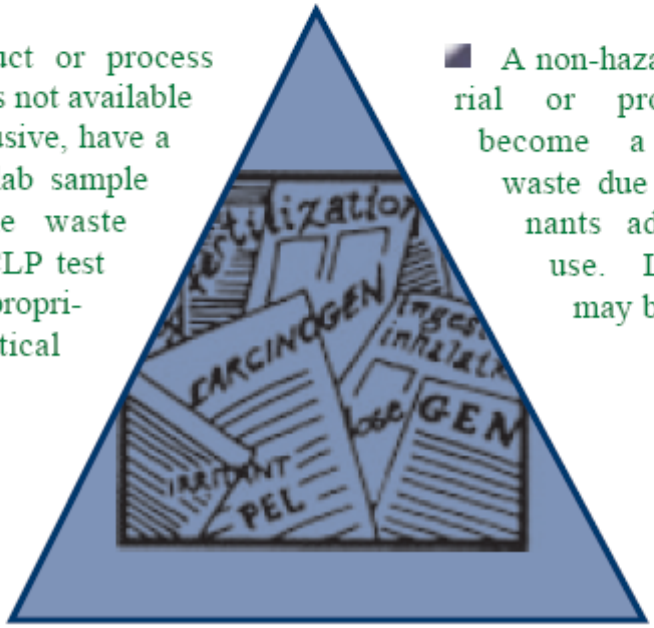
Small amounts of very dangerous wastes, such as arsenic and cyanide compounds, are regulated in the same way as large amounts of other wastes. A business that generates 2.2 pounds (1 kilogram) or more of these acutely hazardous wastes per month is subject to full regulation under the hazardous waste rules.

Identifying Your Hazardous Wastes

It is very important to determine whether a waste is hazardous or non-hazardous. There are several ways to identify hazardous wastes.

- Always ask for a Material Safety Data Sheet (MSDS) before ordering any new product. The MSDS will give you valuable information about the product.
- Talk to product suppliers and manufacturers.
- Read product labels.
- Compare product and process information to hazardous waste characteristics and to wastes listed in federal regulations.

- If product or process information is not available or is inconclusive, have a commercial lab sample and test the waste using the TCLP test or other appropriate analytical tests.



- A non-hazardous material or product may become a hazardous waste due to contaminants added during use. Lab testing may be necessary.

Sources of Hazardous Waste

Used Oil

Used oil that is not recycled or is rendered unrecyclable may be regulated as a hazardous waste. If oil is spilled on the ground and not cleaned up immediately, the oil and soil possibly are hazardous and may cause a groundwater contamination problem.

Lead Acid Batteries

Lead acid batteries that are not recycled or are managed in a manner to allow a discharge are possible hazardous wastes.

Engine Coolant

Engine coolant that is not recycled must be tested prior to disposal. It often is a hazardous waste because of lead or solvent content. It may not be discharged directly to the environment.

Parts Cleaners and Parts Washers

Spent parts cleaners and washers are considered hazardous wastes because they have a low flashpoint (less than 140 degrees Fahrenheit) or may be toxic. Common solvents include mineral spirits, MEK, 1,1,1-trichloroethane and toluene. Solvents become hazardous wastes because they are contaminated with heavy metals such as lead, cadmium, chromium or barium. Do not mix spent solvents with used oil. Mixing a hazardous cleaner with another substance may make the mixture hazardous.

Shop Rags

Rags contaminated with used oil or solvents may be a hazardous waste. If your shop washes rags, water must be discharged to a publicly-owned sanitary sewer, not a storm sewer, septic tank or cesspool. If you use a towel service, make sure the company discharges its water to a publicly-owned sewer system.

Mercury-Containing Devices

Mercury-containing devices may not be incinerated or landfilled in any quantity, not even one. They either must be recycled or handled as hazardous waste. Recycling is easier and costs less. The department recommends recycling of all mercury-containing devices. Examples of these devices include fluorescent and high-density discharge lamps, thermostats, and trunk and hood light switches.

Who needs to know if my business generates hazardous waste?

Post Emergency Information

Post the following information near every telephone:

* Fire department phone number.
* Emergency coordinator's name and phone number.
* Locations of fire alarms and extinguishers.
* Locations of spill control materials.

Notify FDEP

If your business is a small or large quantity generator, notify FDEP to obtain an EPA identification number. Local environmental agencies also should be notified.

Notify local authorities

Police and fire departments and local hospitals that would respond to an emergency need to know that there are hazardous wastes on your property.

Designate an emergency coordinator

This person must know what to do in case of fire, spill or other emergency and must be on the premises or on call 24 hours a day.

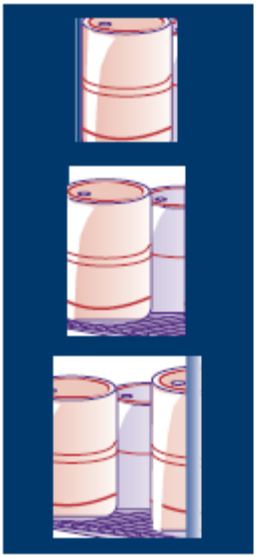
Develop a contingency plan

Guidance on contingency plans is available from FDEP. Large quantity generators must have a written plan that includes:

* Emergency response arrangements with police, fire, hospitals and emergency response contractors.
* Emergency coordinator's address and phone number.
* On-site emergency equipment descriptions and locations.
* Evacuation plan and routes, including a site diagram.
* Spill reporting procedures.

How should I manage hazardous wastes?

First, determine how much hazardous waste you generate **each month**. The rules you must follow depend on how much you generate, how much you store and how long you store it.



Less than 220 pounds (100 kilograms or about half a drum): you are a "Conditionally Exempt Small Quantity Generator."

220 - 2,200 pounds (100-1,000 kilograms or about half a drum to 5 drums): you are a "Small Quantity Generator."

More than 2,200 pounds (1,000 kilograms or more than about 5 drums): you are a "Large Quantity Generator."

The following practices may be required for your business. Even if they are not required, they are good waste management practices. Additional information is available from FDEP.

Containers

- Maintain containers in good condition. Prevent leaks, ruptures and accumulation of rainwater on tops of drums.
- If a container leaks, transfer waste to a new container.
- Keep containers closed. Use self-closing funnels when adding waste. Do not allow wastes to evaporate.
- Wastes must be compatible with the container. For example, use HDPE plastic containers for corrosive wastes.
- Never place incompatible wastes such as wastes that react with each other (e.g., acids and bases) in the same container.

Storage

- Maintain adequate aisle space between container rows to allow inspection for leaks and damages.
- Store ignitable and reactive wastes at least 50 feet from property boundaries.
- Store containers with incompatible wastes in separate areas.
- Time limit for SQGs is 180 days. It is 90 days for LQGs.

Labels

HAZARDOUS WASTE
Federal Law Prohibits Improper Disposal

If found, please contact the nearest police, public safety authority or the U.S. EPA

(Your business name, address and manifest document number)

- The above label represents proper wording for a hazardous waste label. You must also comply with DOT.
- Label every container with the type of waste and whether it is hazardous or non-hazardous or used oil.
- Include the accumulation start date (the date when waste was first placed in the drum).

Transport and Disposal

- Make sure your transporter and disposal facility have EPA identification numbers.
- Use manifests for all hazardous wastes shipped off-site. Keep the manifests on-site.

Inspections and Recordkeeping

- Inspect containers at least once a week and keep a written log of container inspections.
- Keep a record of larger spills and use this information to identify the spill prevention options that might help your shop.
- Keep training and inspection records for three years.
- Keep manifests and shipping receipts for three years.
- Keep records of tests for three years.
- Keep land disposal restriction forms for three years from the date the waste was last shipped.

Training

- Train all employees to identify, reduce and properly handle wastes.
- Train new employees before they handle hazardous wastes.

How can I reduce hazardous wastes?

Reducing hazardous wastes makes good business sense. Benefits include:

- Saving money on waste management costs.
- Reducing concerns about penalties and liability.
- Creating a safer, healthier workplace.
- Promoting positive public relations with clients, customers and the local community.

How do I begin?

- The shop owner or manager must be committed to waste minimization and pass that commitment on to the employees.
- Evaluate your shop's wastes and identify areas where changes can be made.
- Involve employees in designing and implementing pollution prevention measures.

Solvents

- Reduce or eliminate solvent use by determining whether cleaning is really necessary.
- Use a multi-purpose solvent to reduce the types of hazardous waste that need to be managed.
- Substitute detergent-based solution for caustic solution when cleaning; substitute water-based cleaners for solvent cleaners.
- Consider switching to a water-based cleaner instead of using chlorinated spray cans of brake cleaner or carburetor cleaner.
- Use solvent sinks properly: use drip trays, allow more drainage time, use filters to prolong solvent life and keep lids closed when not in use.
- Replace solvent only when necessary.
- Use dedicated equipment to minimize cross-contamination.

Automotive Fluids

- Keep used oil and other vehicle fluids segregated from solvent wastes and carburetor cleaner.
- Store large quantities of batteries in an isolated area with no floor drains. Storage areas should be sealed with an acid-resistant material.
- Label waste containers clearly to prevent contamination of non-hazardous wastes.

- Contract with approved recycling services for used antifreeze, lead-acid batteries, used oil and oil filters.
- Use separate receptacles for draining used oil and antifreeze.
- Educate customers about recommended maintenance schedules and replacing fluids only when necessary.

Shop Practices

- Minimize inventory and use a "first-in, first-out" system to prevent the need for disposal of unused materials.
- Do not discharge shop wastes to the ground surface or to septic tanks. Plug floor drains.
- Manage wastes in an appropriate manner to prevent discharges to the environment. Keep containment structure valves closed.
- Keep soiled shop towels in a clearly labeled, closed container.
- Store partially used absorbents in closed, labeled containers for reuse.
- Use drip pans under leaking cars, machinery and pipes or under removed parts rather than cleaning them up with absorbents. The liquids could be reused or recycled if separate drip pans are used.
- Pre-clean parts with a squeegee, rag or wire brush. This approach helps minimize or possibly eliminate the use of hazardous solvents and prolongs the life of cleaning solutions.

Checklist

This checklist will help you prevent the most common hazardous waste violations. For more detailed information on hazardous waste management requirements, contact FDEP.

- ☐ Identify and record quantities of hazardous waste monthly.
- ☐ Obtain an EPA identification number, if needed.
- ☐ Use proper containers to collect and store wastes or products.
- ☐ Label all containers whether product or waste as to their contents.
- ☐ Keep all hazardous waste or products containing regulated solvents closed at all times unless actively removing from or adding to it.
- ☐ Inspect all regulated management areas.
- ☐ Designate an emergency coordinator.
- ☐ Post emergency information near each phone.
- ☐ Develop a contingency plan for emergencies.
- ☐ Use manifests for all waste transported for disposal.
- ☐ Keep all records for at least three years.

Dos and Don'ts

DO
Keep containers closed

DON'T
Leave containers open

DO
Keep accurate inspection logs

DO
Label all containers

DON'T
Leave containers unlabeled

Tips from Inspectors

Drums

- You cannot have any mystery drums. All drums must be labeled and have a "birthdate" on them.
- Evaporation of hazardous waste is a serious violation. Do not allow the hazardous wastes to evaporate. You must keep the drum closed when you are not in the process of putting waste into the drum. You also are required to keep the top of the drum clean.
- Do not store old drums outside. If they get stormwater inside them, you will have to sample the stormwater and determine whether or not the water in the drum is hazardous. Insist that the person who sold you the drum and its contents takes the drum back when you are done with it.
- Inspectors go into dumpsters and walk the entire property line of a business. They go back into trees looking for orphan drums and distressed/dead vegetation.

Oil

- You cannot use used motor oil for weed control. Used oil containers must not leak and be in good shape. You must retain your used oil filter records for three years. The inspectors spend a lot of time on used oil inspections.

Spills

- You must clean up your spills at the time of the spill.
- Be sure to store old automotive batteries on a floor that is under a roof. Do not stack batteries. If they fall over, they will leak acid and create a spill problem.

Transport

- The only generators who are allowed to transport their own waste are conditionally exempt small quantity generators. All other generators must use a hazardous waste hauler who has a permit from the FDEP and the US EPA.

Waste

- The most common violation is the non-determination of whether or not something is a waste.
- Abandoned products are a waste.
- If you throw away containers, make sure the container is completely empty before you place it in a waste receptacle. If you throw away aerosol cans, make sure the can has a hole in it, and that you have drained the liquids out of the can. If you are throwing away paint containers, be sure to drain all the paint out of the container.

Water

- If you discharge any waste that could be construed as a hazardous waste into a city sewer, you must have the written permission of the city sewer system. The city sewer system must be a Publicly Owned Treatment Works (POTW). It cannot be a privately owned package plant.
- If you use rags, you should send the rags to a linen service that is served by a publicly owned sewage treatment plant. If you use paper towels, you must make a determination as to whether the used paper towels are a hazardous waste.
- Know where your drains go. All drains that lead from a hazardous materials area to a stormwater area should be sealed shut

Where can I get more information?

Additional information on hazardous waste reduction and regulations is available from many sources.

Florida Department of Environmental Protection

District offices and the Tallahassee office offer technical assistance, fact sheets and other publications on hazardous waste regulations.

Hazardous Waste Compliance Assistance Program
Phone: (800) 741-4DEP
(850) 245-8707
Fax: (850) 245-8810

Information about the Universal Waste rule can be found at:
http://www.dep.state.fl.us/waste/categories/mercury/pages/laws.htm
or by calling (800) 741-4DEP

Available publications include:
- Summary of Hazardous Waste Regulations
- Requirements for Conditionally Exempt Small Quantity Generators
- Requirements for Small Quantity Generators
- Handbook for Small Quantity Generators of Hazardous Waste

U.S. Environmental Protection Agency

The EPA has published a series of industry-specific guidelines and handbooks on preventing pollution and complying with hazardous waste regulations.

RCRA Hotline: (800) 424-9346

Your Trade Associations

Many trade associations have published guides to help you find solutions to your hazardous waste management problems.

Florida Small Business Assistance Program

The Small Business Assist-ance Program helps businesses with environmental concerns and problems related to compliance with air regulations. Assistance is confidential and staff experts have business experience.

Phone: (800) 722-7457

Offices of the Florida Department of Environmental Protection

Hazardous Waste Regulation Section
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, FL 32399-2400
(800) 741-4DEP

Northeast District
7825 Baymeadows Way, Suite 200B
Jacksonville, FL 32256
(904) 807-3300

Northwest District
160 Government Center
Pensacola, FL 32501
(850) 595-8300

Southwest District
3804 Coconut Palm Dr.
Tampa, FL 33619
(813) 744-6100

Central District
3319 Maguire Blvd.
Orlando, FL 32803
(407) 894-7555

South District
P.O. Box 2549
2295 Victoria Ave., Suite 364
Fort Myers, FL 33902-2549
(239) 332-6975

Southeast District
400 N. Congress Ave.
West Palm Beach, FL 33401
(561) 681-6600

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For additional information contact:
Janet Ashwood
Florida Department of Environmental Protection
Hazardous Waste Compliance Assistance Program
Tallahassee, FL
Phone: (800) 741-4337
(850) 245-8707

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Appendix E **INTERIM GUIDANCE on the MANAGEMENT of ANTIFREEZE DESTINED for RECYCLING**

Florida Department of
Environmental Protection

Memorandum

TO: Directors of District Management
Waste Program Administrators

FROM: John M. Ruddell, Director
Division of Waste Management

DATE: August 6, 1996

SUBJECT: Interim Guidance on the Management of Antifreeze Destined for Recycling

The U.S. EPA published the final Universal Waste Rule in the Federal Register on May 11, 1995. This rule provides more flexible alternate management procedures for certain wastes (hazardous waste batteries, pesticides and mercury-containing thermostats) in lieu of the more stringent RCRA hazardous waste procedures. Florida adopted the Universal Waste Rule on September 7, 1995.

An important provision in the rule is that states can add other "universal" wastes (for example, antifreeze) to this management scheme. This option enhances flexibility for states without requiring the wastes to also be added at the federal level. Plans are underway by the Department to add hazardous waste antifreeze to its list of "universal" wastes in the near future.

While in the process of rulemaking, the Department is issuing interim guidelines, effective immediately, to promote the collection and recycling of used antifreeze by generators and handlers. The interim guidelines are incorporated in the attached fact sheet entitled "Best Management Practices for Managing Antifreeze Destined for Recycling." One important provision of these best management practices is that a generator or handler that is recycling used antifreeze on-site or sending it off-site for recycling will not be requested to make a hazardous waste determination as required by 40 C.F.R., Section 262.11.

However, generators and handlers disposing of waste antifreeze, other than through legitimate recycling, will be subject to the hazardous waste determination requirements of 40 C.F.R., Section 262.11 and all other applicable regulatory requirements. Mixing antifreeze with used oil for the purpose of energy recovery is not considered legitimate recycling. The

additional attached fact sheet entitled "Florida Fact Sheet on the Management of Waste Antifreeze, 4/20/95" describes the management of waste antifreeze destined for disposal.

JMR/gp

Attachments

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FLORIDA FACT SHEET ON THE BEST MANAGEMENT PRACTICES FOR ANTIFREEZE DESTINED FOR RECYCLING

Container Management, Handling and Storage

- Use dedicated antifreeze collection equipment. This would include collection funnels, transfer pans or buckets, and storage containers (drums or tanks). Transfer used antifreeze immediately to a dedicated storage container.
- Keep stored antifreeze free from cross-contamination by oil, fuels and degreasers by providing a separate, well-labeled container meeting DOT specifications/UN performance criteria.
- Containers must be in good condition. Replace leaking containers immediately.
- Containers must be compatible with the antifreeze stored in them.
- Keep antifreeze containers closed at all times except when emptying or filling.
- Inspect containers at least weekly to check for signs of leaks or deterioration caused by corrosion or other factors.
- Antifreeze containers must be protected from the elements and located in a secured area.
- Tanks used to hold used antifreeze must meet the requirements of the Title 40 Code of Federal Regulations (C.F.R.), Part 265, Subpart J regulations.

Labeling/Marking

- Label used antifreeze collection equipment and containers with the words "Used Antifreeze".
- Label reconditioned or recycled antifreeze containers with the words "Reconditioned or Recycled Antifreeze".
- Mark used antifreeze containers with the starting date of accumulation.

Accumulation Time Limits

Do not accumulate used antifreeze for longer than 180 days.

Filter Management

A hazardous waste determination must be made on the waste antifreeze filters generated from the recycling process equipment as specified in 40 C.F.R., Section 262.11.

Record Keeping

Keep all receipts of used antifreeze shipments and filter management. The written receipts or records must include:

- Name and address of the generator and the recycling facility for off-site shipments;
- The amount of used antifreeze shipped off-site or recycled on-site;

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- The amount of waste antifreeze filters shipped off-site; and the
- Date of shipment or recycling.

Recycling and the Resale of Reconditioned/Recycled Antifreeze

- Currently, the Florida Department of Agriculture and Consumer Services does not register "recycled" antifreeze/coolant products. However, you are subject to registration if your antifreeze/coolant product is marketed and distributed by brand name in a sealed package unit. Contact the Florida Department of Agriculture and Consumer Services, Division of Standards at (850) 488-9740 for additional information.
- The mixing of used antifreeze with used oil for the purpose of burning this commingled material for energy recovery is not considered to be "recycling" that is covered by these guidelines.

For additional information on the waste management requirements for the automotive industry, call or write the:

Small Quantity Generator Coordinator, MS 4555
Hazardous Waste Management Section
Florida Department of Environmental Protection
2600 Blair Stone Road
Tallahassee, Florida 32399-2400
Phone: (850) 245-8707
Information Line
1-800-741-4DEP
Internet site:
http://www.dep.state.fl.us/

Rev. 10-30-1998

FLORIDA FACT SHEET ON THE MANAGEMENT OF WASTE ANTIFREEZE

4/20/95

Improper disposal of antifreeze can cause environmental problems. Antifreeze is made up of water and ethylene or propylene glycol. Neither of these unused ingredients would be regulated as a hazardous waste. However, heavy metal contaminants such as lead and organics such as benzene, tetrachloroethylene (PERC) or trichloroethylene have been found in waste antifreeze at levels that would identify the waste antifreeze as hazardous. Under the federal and state hazardous waste regulations, any waste containing regulated levels of heavy metals or organics would be hazardous waste.

Each business that generates solid waste must make a hazardous waste determination as required by Title 40, Code of Federal Regulations (CFR), Section 262.11. A waste determination can be made by testing the waste using the Toxicity Characteristic Leaching Procedure (TCLP), Test Method 1311, or by applying knowledge of the waste in light of the materials or the processes used.

Since the quality and nature of waste antifreeze can be dependent upon conditions not in the control of the generator of the waste antifreeze (e.g., type of radiator, maintenance, additives, etc.), it may not be possible to use product or process knowledge without first testing to make a hazardous waste determination. A generator can establish product knowledge by initially testing to determine whether the waste antifreeze is, or is not, hazardous waste. If the testing indicates the waste antifreeze does not exhibit a characteristic of hazardous waste, product knowledge (based on initial testing) may be used until the process changes.

If the generator determines that the waste is, or is not, hazardous waste based on product knowledge of the waste, then all supporting data used to make this determination must be retained on site in the generator's files. If a generator determines that the waste is, or is not, hazardous waste based on testing this waste or an extract developed using the TCLP, Test Method 1311, all waste analysis data must be retained on-site in the generator's files. The testing and analysis must be repeated if the process generating the waste has changed. TCLP testing can be limited to the contaminants that are most likely to be found in the waste antifreeze. These include lead, benzene, tetrachloroethylene (PERC) and trichloroethylene.

Copies of all notices, certifications, waste analysis data, and other documentation must be retained for five years from the date that the waste was last sent to recycling facility or an on site or off site treatment, storage, or disposal facility.

Facilities generating 220 pounds per month or greater of all hazardous waste (including many recyclable wastes such as antifreeze) are subject to the requirements of 40 CFR, Parts 262 through 268, 270 and the notification requirements of Section 3010 of RCRA.

Rev. 07/16/99

These facilities (SQGs and LQGs) cannot offer waste antifreeze that is hazardous waste to an unregistered hazardous waste transporter. Also, the generator and recycler must comply with the Clean Water Act pretreatment standards and related locally based discharge limits for discharges to the sewer.

Under the hazardous waste regulations, facilities generating less than 220 pounds of hazardous waste per month and accumulating no more than 2,200 pounds of hazardous waste at any time are not subject to the requirements of 40 CFR, Parts 262 through 268, 270 and the notification requirements of Section 3010 of RCRA provided they comply with 40 CFR, Section 261.5, "Special requirements for hazardous waste generated by conditionally exempt small quantity generators (CESQGs)". These CESQG facilities must assure delivery of hazardous waste to a proper recycling or treatment, storage, or disposal facility. They do not have to use a registered hazardous waste transporter. CESQGs which choose to send their hazardous waste to a recycling facility or an off-site treatment, storage or disposal facility shall document delivery of the hazardous waste through written receipts or other records which are retained for at least three years. The written receipts or other records shall include names and addresses of the generator and the recycling, treatment, storage or disposal facility, the type and amount of hazardous waste delivered, and the date of shipment.

The Department encourages the proper recycling of waste antifreeze. There are waste antifreeze service companies that will service and recycle your antifreeze.

For additional information or to receive a copy of "Summary of Hazardous Waste Regulations" or "Florida's Handbook for Small Quantity Generators of Hazardous Waste" contact:

Small Quantity Generator Coordinator, MS 4555
Hazardous Waste Management Sections
Florida Department of Environmental Protection
2600 Blair Stone Road
Tallahassee, Florida 32399-2400
(850) 245-8707
Internet site:
http://www.dep.state.fl.us/

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Appendix F **A GUIDE on HAZARDOUS WASTE MANAGEMENT for FLORIDA'S PAINT AND BODY SHOPS**

Florida Department of Environmental Protection Hazardous Waste Compliance Assistance Program

This document was published to help educate businesses on hazardous waste management issues affecting them. The suggested options may help businesses to operate in an environmentally appropriate manner. Some of the options may go beyond what is required to remain in compliance with regulations. Business owners are responsible for obtaining complete information about applicable regulations. Misrepresentations or omissions by the Florida Department of Environmental Protection or the Florida Center for Solid and Hazardous Waste Management do not relieve any person from any requirement of federal regulations or Florida law.

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http://www.dep.state.fl.us
http://www.epa.gov

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Revised 6/2002

Why should I care about hazardous wastes?

As a business owner, operator or employee, you may be producing materials that can harm people and the environment. This booklet offers helpful tips on how to:

- Comply with federal and state hazardous waste regulations.
- Avoid penalties by properly managing hazardous wastes.
- Save money on disposal costs by reducing hazardous wastes.

Health and Environment

Hazardous wastes spilled or dumped on the ground or disposed in dumpsters may seep into the groundwater and contaminate drinking water supplies.

Hazardous wastes may run off into the nearest body of water where they may poison or kill fish and other wildlife.

Hazardous wastes pose a risk to you, your employees and your community.

Cost Savings

State and county inspectors may visit your business to ensure that hazardous wastes are being managed properly. State penalties range from $100 to $50,000 **per violation per day**.

Reducing hazardous wastes can reduce your production and disposal costs and reduce your risk of future liability.

Public Image

Your customers will appreciate your efforts to prevent pollution.

Your community will recognize your business as a good neighbor.

What is a hazardous waste?

A waste is hazardous if:

- It is listed as a hazardous waste in Title 40 Code of Federal Regulations (CFR) Part 261, Subpart D.
- It has any of the characteristics described below:

Characteristic Wastes

Ignitable

Ignitable wastes are flammable or spontaneously combustible. If they have a flashpoint of 140 degrees Fahrenheit or less, they are a hazardous waste. Examples include paints, paint solvents, other solvents and degreasers.

Corrosive

Corrosive wastes can burn the skin or corrode metals. Liquids with a pH of 2 or lower or 12.5 or higher are corrosive. Examples include rust removers, acidic or alkaline fluids and battery acid.

Reactive

Reactive wastes are unstable and may explode or react violently with water or other materials. Examples include bleaches, oxidizers, cyanides and explosives, such as sodium azide and dyna-mite.

Toxic

Wastes are toxic if they contain certain heavy metals above specific concentrations, such as chromium, lead or cadmium, or toxic organic chemicals. Examples include parts cleaners, mercury switches, chromium-bearing paints and spray booth filters.

Listed Wastes

Some industrial processes and chemical wastes are listed specifically as hazardous in the federal regulations under 40 CFR 261, Subpart D. Copies of the rule can be found at many public libraries, on the Internet or may be purchased from the Government Printing Office.

Acutely Hazardous Wastes

Small amounts of very dangerous wastes, such as arsenic and cyanide compounds, are regulated in the same way as large amounts of other wastes. A business that generates 2.2 pounds (1 kilogram) or more of these acutely hazardous wastes per month is subject to full regulation under the hazardous waste rules.

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It is very important to determine whether a waste is hazardous or non-hazardous. There are several ways to identify hazardous wastes.

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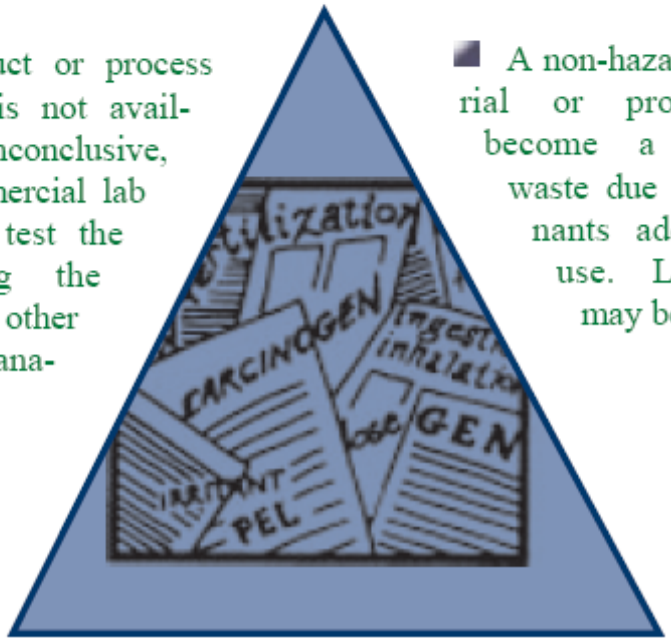
- If product or process information is not available or is inconclusive, have a commercial lab sample and test the waste using the TCLP test or other appropriate analytical tests.



- A non-hazardous material or product may become a hazardous waste due to contaminants added during use. Lab testing may be necessary.

Sources of Hazardous Waste

Painting and Paint Removal

Waste paint contaminated materials, such as paint booth filters, masking paper and overspray paper, may be hazardous because of heavy metal pigments in paints. Hazardous wastes can be minimized with equipment that has greater transfer efficiency. Reducing wastes saves money and makes cleanup easier.

Waste paints, paint strippers and thinners may be ignitable and may contain hazardous materials such as heavy metals, toluene, xylene, acetone, methyl ethyl ketone, petroleum distillates, methylene chloride or methyl isobutyl ketone.

Cleanup

Rags contaminated with solvents or other substances may be a hazardous waste. If your shop washes rags, water must be discharged to a publicly-owned sanitary sewer, not a storm sewer, septic tank or cesspool. If you use a towel service, make sure the company discharges its water to a publicly-owned sewer system.

Disposable rags or paper towels used with hazardous substances should be disposed as hazardous wastes. They should not be disposed in a dumpster.

Water should not be used to clean shop floors because it may be contaminated by hazardous substances on the floor. Prevent water from entering floor drains by plugging drains.

Containers

Disposable containers with hazardous material residues (other than paint cans with a thin dry coating of paint) must be disposed as hazardous wastes.

Who needs to know if my business generates hazardous waste?

Post Emergency Information

Post the following information near every telephone:

* Fire department phone number.
* Emergency coordinator's name and phone number.
* Locations of fire alarms and extinguishers.
* Locations of spill control materials.

Notify FDEP

If your business is a small or large quantity generator, notify FDEP to obtain an EPA identification number. Local environmental agencies also should be notified.

Notify local authorities

Police and fire departments and local hospitals that would respond to an emergency need to know that there are hazardous wastes on your property.

Designate an emergency coordinator

This person must know what to do in case of fire, spill or other emergency and must be on the premises or on call 24 hours a day.

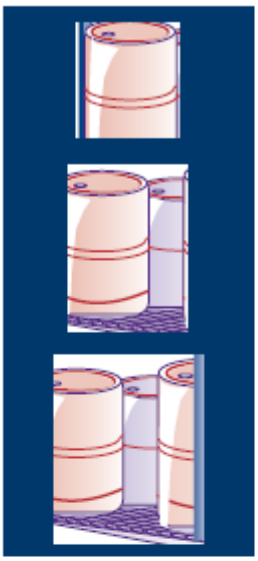
Develop a contingency plan

Guidance on contingency plans is available from FDEP. Large quantity generators must have a written plan that includes:

* Emergency response arrangements with police, fire, hospitals and emergency response contractors.
* Emergency coordinator's address and phone number.
* On-site emergency equipment descriptions and locations.
* Evacuation plan and routes, including a site diagram.
* Spill reporting procedures.

How should I manage hazardous wastes?

First, determine how much hazardous waste you generate **each month**. The rules you must follow depend on how much you generate, how much you store and how long you store it.



Less than 220 pounds (100 kilograms or about half a drum): you are a "Conditionally Exempt Small Quantity Generator."

220 - 2,200 pounds (100-1,000 kilograms or about half a drum to 5 drums): you are a "Small Quantity Generator."

More than 2,200 pounds (1,000 kilograms or more than about 5 drums): you are a "Large Quantity Generator."

The following practices may be required for your business. Even if they are not required, they are good waste management practices. Additional information is available from FDEP.

Containers

- Maintain containers in good condition. Prevent leaks, ruptures and accumulation of rainwater on tops of drums.
- If a container leaks, transfer waste to a new container.
- Keep containers closed. Use self-closing funnels when adding waste. Do not allow wastes to evaporate.
- Wastes must be compatible with the container. For example, use HDPE plastic containers for corrosive wastes.
- Never place incompatible wastes, such as wastes that react with each other (e.g., acids and bases) in the same container. Elementary neutralization is OK (e.g., acids and cyanides).
- Disposable containers with hazardous material residues (other than paint cans with a thin dry coating of paint) must be disposed as hazardous wastes.
- Reuse thinner as wash thinner. Be careful to keep paint waste sepa rate from wash thinner.

Storage

- Maintain adequate aisle space between container rows to allow inspection for leaks and damages.

- Store ignitable and reactive wastes at least 50 feet from property boundaries.
- Store containers with incompatible wastes in separate areas.
- Be aware of allowable time limits for storage.
- Keep wastes segregated so they may be recycled more easily.
- Two or more types of waste that are recyclable separately may not be recyclable if they are mixed during storage.
- Storage time limit is 180 days for SQGs and 90 days for LQGs.

Labels

- The above label represents proper hazardous waste pre-shipping labeling. You must also comply with DOT.
- Include federal waste code numbers.
- Label every container with the type of waste and whether it is hazardous or non-hazardous.
- Include the accumulation start date (the date when waste was first placed in the drum).

Transport and Disposal

- Make sure your transporter and disposal facility have EPA identification numbers.
- Use manifests for all hazardous wastes shipped off-site. Keep the manifests on-site.

Inspection and Recordkeeping

- Inspect containers at least once a week and keep a written log of container inspections.
- Keep training and inspection records for three years.
- Keep manifests and shipping receipts for three years.
- Keep records of tests for three years.
- Keep land disposal restriction forms for three years from the date the waste was last shipped.

How can I reduce hazardous wastes?

Reducing hazardous wastes makes good business sense. Benefits include:

- Saving money on waste management costs.
- Reducing concerns about penalties and liability.
- Creating a safer, healthier workplace.
- Promoting positive public relations with clients, customers and the local community.

How do I begin?

- Make a commitment to reducing wastes in every area of your business.
- Identify your shop's wastes and identify areas where changes can be made.
- Encourage the participation of all employees through education, training and incentives.

Solvents

- Use a multi-purpose solvent to reduce the types of hazardous waste that need to be managed.
- Find less hazardous substitutes for solvents, such as citrus-based, water-based or detergent-based cleaners.
- Reduce solvent waste by replacing solvent only when necessary.
- Use spigots and pumps to transfer thinners from storage drums to smaller containers.
- Contract with recycling services for thinners and other solvents.
- Use self-closing funnels to add waste to containers.
- Use a two-stage cleaning process (dirty solvent followed by clean rinse) to reduce solvent usage.
- Some spent thinners and solvents can be used directly for other purposes before being sent to a recycler. For example, color-contaminated thinner may be reused as an undercoating paint thinner. Also, some spent solvents may be used for equipment and parts cleaning.

Training

- Train employees to use solvents and chemicals correctly and efficiently, using minimal amounts required to get the job done.
- Employees should be made aware of the importance of pollution prevention.

Painting

- Replace paints containing heavy metal pigments with less toxic or non-toxic paints.
- Analyze paint and solvent wastes for toxic materials.
- Use more efficient spray equipment--paint overspray creates waste.
- Replace aerosol cans with refillable containers that use compressed air as the propellant.
- Properly store any aerosol cans away from moisture, sunlight and extreme heat or cold.
- Replace conventional primers with water-based primers.
- Replace lacquers and enamels with low-VOC coatings.
- Use entire contents of aerosol can, including the propellant.

Shop Practices

- Minimize inventory and use a "first-in, first-out" system to prevent the need for disposal of old unused materials.
- Store raw materials and wastes in closed containers in a covered area protected from rain and sunlight.
- Use spigots and pumps when dispensing new materials and funnels when transferring wastes to storage containers. This reduces the possibility of spills.
- Use drip trays under solvent storage drums.
- Prevent leaks and spills. Keep floors clean.
- Use the least hazardous type of floor cleaner available.
- For dirty rags, use an approved laundry service that discharges its water to a publicly owned sewer system.
- Do not discharge wastes to the ground surface or to floor drains.

Checklist

This checklist will help you prevent the most common hazardous waste violations. For more detailed information on hazardous waste management requirements, contact FDEP.

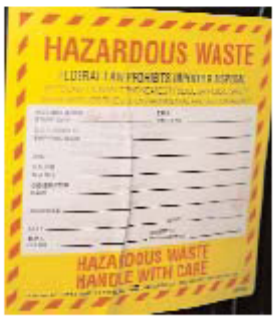
- ☐ Identify and record quantities of hazardous waste monthly.
- ☐ Obtain an EPA identification number, if needed.
- ☐ Use proper containers to collect and store wastes or products.
- ☐ Label all containers whether product or waste as to their contents.
- ☐ Keep all hazardous waste or products containing regulated solvents closed at all times unless actively removing from or adding to it.
- ☐ Inspect containers weekly for rust, leaks or damage.
- ☐ Train employees to properly handle hazardous wastes.
- ☐ Designate an emergency coordinator.
- ☐ Post emergency information near each phone.
- ☐ Develop a contingency plan for emergencies.
- ☐ Use manifests for all waste transported for disposal.
- ☐ Keep all records for at least three years.

Dos and Don'ts

DO
Keep containers closed

DON'T
Leave containers open

DO
Keep accurate inspection logs



DO
Label all containers

DON'T
Leave containers unlabeled

Tips from Inspectors

Drums

- You cannot have any mystery drums. All drums must be labeled and have a "birthdate" on them.
- Evaporation of hazardous waste is a serious violation. Do not allow the hazardous wastes to evaporate. You must keep the drum closed when you are not in the process of putting waste into the drum. You also are required to keep the top of the drum clean.
- Do not store old drums outside. If they get stormwater inside them, you will have to sample the stormwater and determine whether or not the water in the drum is hazardous. Insist that the person who sold you the drum and its contents takes the drum back when you are done with it.
- Inspectors go into dumpsters and walk the entire property line of a business. They go back into trees looking for orphan drums and distressed/dead vegetation.

Oil

- You cannot use used motor oil for weed control. Used oil containers must not leak and must be in good condition. You must retain your used oil filter records for three years. The inspectors spend a lot of time on used oil inspections.

Spills

- You must clean up your spills at the time of the spill.
- Be sure to store old automotive batteries on a floor that is under a roof. Do not stack batteries. If they fall over, they will leak acid and create a spill problem.

Transport

- The only generators who are allowed to transport their own waste are conditionally exempt small quantity generators. All other generators must use a hazardous waste hauler who has a permit from the FDEP and the US EPA.

Waste

- The most common violation is the non-determination of whether something is a waste.
- Abandoned products are a waste.
- If you throw away containers, make sure the container is completely empty before you place it in a waste receptacle. If you throw away aerosol cans, make sure the can has a hole in it, and that you have drained the liquids out of the can. If you are throwing away paint containers, be sure to drain all the paint out of the container.

Water

- If you discharge any waste that could be construed as a hazardous waste into a city sewer, you must have the written permission of the city sewer system. The city sewer system must be a Publicly Owned Treatment Works (POTW). It cannot be a privately owned package plant.
- If you use rags, you should send the rags to a linen service that is served by a publicly owned sewage treatment plant. If you use paper towels, you must make a determination as to whether the used paper towels are a hazardous waste.
- Know where your drains go. All drains that lead from a hazardous materials area to a stormwater area should be sealed shut.

Where can I get more information?

Additional information on hazardous waste reduction and regulations is available from many sources.

Florida Department of Environmental Protection

District offices and the Tallahassee office offer technical assistance, fact sheets and other publications on hazardous waste regulations.

Hazardous Waste Compliance Assistance Program
Phone: (800) 741-4DEP
(850) 245-8707
Fax: (850) 245-8810

Information about the Universal Waste rule can be found at:
http://www.dep.state.fl.us/waste/categories/mercury/pages/laws.htm
or by calling (800) 741-4DEP

Available publications include:
- Summary of Hazardous Waste Regulations
- Requirements for Conditionally Exempt Small Quantity Generators
- Requirements for Small Quantity Generators
- Handbook for Small Quantity Generators of Hazardous Waste

U.S. Environmental Protection Agency

The EPA has published a series of industry-specific guidelines and handbooks on preventing pollution and complying with hazardous waste regulations.

RCRA Hotline: (800) 424-9346

Your Trade Associations

Many trade associations have published guides to help you find solutions to your hazardous waste management problems.

Florida Small Business Assistance Program

The Small Business Assist-ance Program helps businesses with environmental concerns and problems related to compliance with air regulations. Assistance is confidential and staff experts have business experience.

Phone: (800) 722-7457

Offices of the Florida Department of Environmental Protection

Hazardous Waste Regulation Section
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, FL 32399-2400
(800) 741-4DEP

Northeast District
7825 Baymeadows Way, Suite 200B
Jacksonville, FL 32256
(904) 807-3300

Northwest District
160 Government Center
Pensacola, FL 32501
(850) 595-8300

Southwest District
3804 Coconut Palm Dr.
Tampa, FL 33619
(813) 744-6100

Central District
3319 Maguire Blvd.
Orlando, FL 32803
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South District
P.O. Box 2549
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Southeast District
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West Palm Beach, FL 33401
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For additional information contact:
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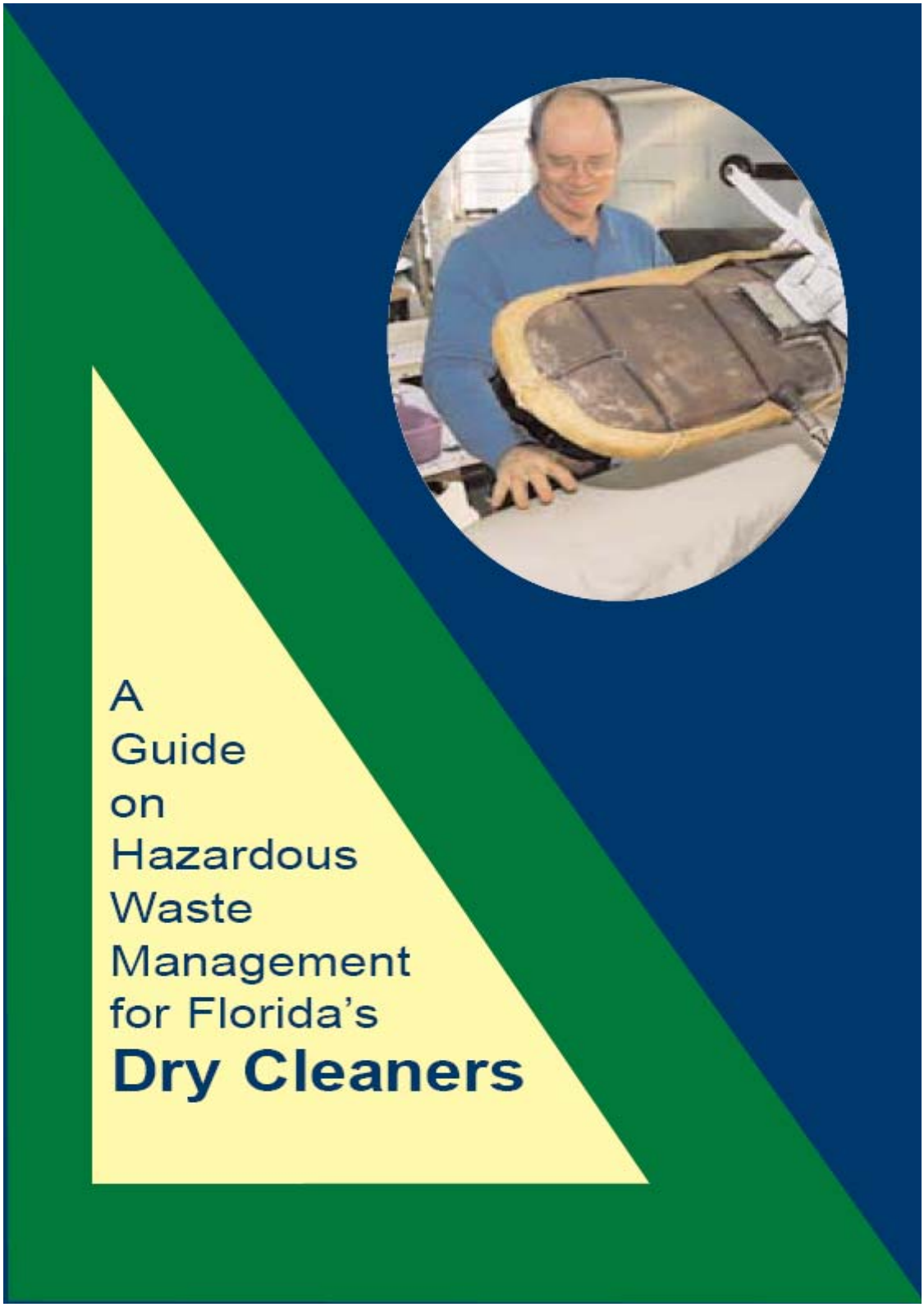
Appendix G **A GUIDE on HAZARDOUS WASTE MANAGEMENT for FLORIDA'S DRY CLEANERS**



Florida Department of Environmental Protection Hazardous Waste Compliance Assistance Program

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Alan Bedwell, FDEP Deputy Secretary
John Ruddell, FDEP Waste Division Director
Bill Hinkley, FDEP Bureau Chief, Solid and Hazardous Waste Section
U.S. Environmental Protection Agency, Region IV

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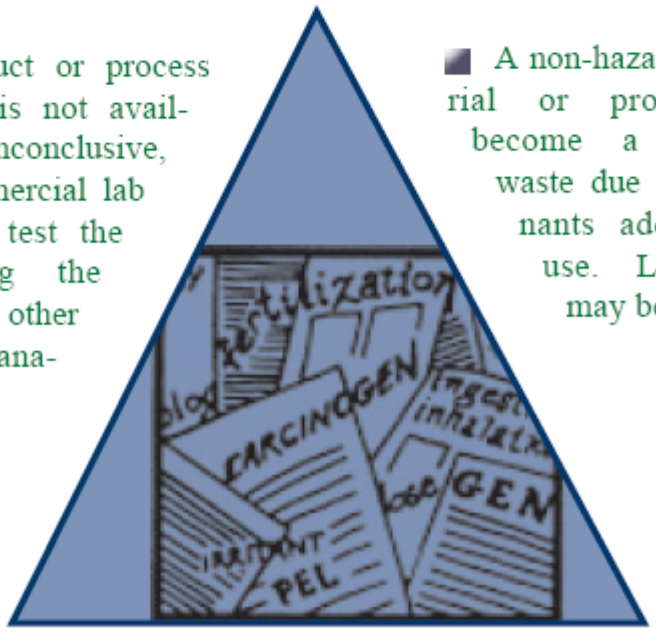


- A non-hazardous material or product may become a hazardous waste due to contaminants added during use. Lab testing may be necessary.

Sources of Hazardous Waste

Vapor Emissions

Process emissions occur as a result of equipment operations, such as washing, aeration and distillation. Vapor control system create wastes such as carbon filters.

Fugitive emissions occur as a result of evaporation during clothing transfer, equipment leaks, losses during solvent transfer, and evaporation from spent filters and distillation wastes.

At night, vapors cool and sink to the floor of the facility and can penetrate through cracks and expansion joints in the concrete slab.

Still Bottoms

Muck is a waste generated by powder filtration systems. Like still bottoms, muck may contain a considerable volume of solvent. Muck is listed as a hazardous waste.

Wastewater

Separator and condensate water containing perchloroethylene (perc) is a hazardous waste and is mismanaged frequently. Wastewater should never be disposed in a septic or sewer system. Perc and perc vapors can leak from sewer pipes and contaminate the environment. Press return or vacuum water contains solvent residue from the steam of pressing. Floor wash water for general cleaning contains perc. It also may contain spilled materials and may be a hazardous waste. Wastewater from spotting and precleaning operations may be hazardous due to constituents in spotting agents.

Spent Filters

Used activated carbon or charcoal filters from a commercial system for treating separator water are hazardous wastes. Cartridge filters commonly are used to purify the solvent during the dry cleaning process. Spent filters from chlorinated solvent dry cleaning operations (perc, fluorocarbon 113, etc.) are listed hazardous wastes. Spent filters from petroleum dry cleaning operations may not be hazardous but should be tested to determine if they are or not.

Others

After use, containers used to store solvents and other wastes still may contain a very small amount of residual material. Even a very small amount could cause significant soil or groundwater contamination if mismanaged.

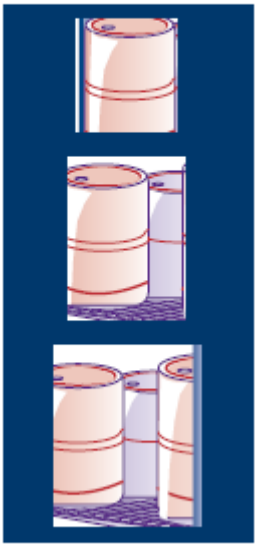
Lint from systems using perc or fluorocarbons must be treated as a hazardous waste and must be kept in its own container or added to the filter drum.

Items that come into contact with perc should be treated as a hazardous waste (e.g., rags or cardboard).

Unused, spilled or off-spec sizing and spotting chemicals may be a hazardous waste.

How should I manage hazardous wastes?

First, determine how much hazardous waste you generate **each month**. The rules you must follow depend on how much you generate, how much you store and how long you store it.



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The following practices may be required for your business. Even if they are not required, they are good waste management practices. Additional information is available from FDEP.

Containers

- Maintain containers in good condition. Prevent leaks, ruptures and accumulation of rainwater on tops of drums.
- If a container leaks, transfer waste to a new container.
- Keep all containers closed. Ring-top type drums must have the ring attached and bolted.
- Wastes must be compatible with the container. For example, use HDPE plastic containers for corrosive wastes.

Storage

- Maintain adequate aisle space between container rows to allow inspection for leaks and damages.
- Time limit for SQGs is 180 days and 90 days for LQGs.
- Coating floors with a perc-resistant material in process and chemical storage areas is recommended and is required in some areas.
- All containers with hazardous waste perc need to be kept within secondary containment.

Labels

- In addition to complying with DOT, the following pre-shipping labeling for hazardous waste should be used:

- Label every container with the type of waste and whether it is hazardous or non-hazardous.
- Include the accumulation start date (the date when waste was first placed in the drum).
- All containers, managing products or wastes should be clearly labeled with their contents. This includes the shop vac, if it contains hazardous waste lint.
- Include federal waste code numbers.

Transport and Disposal

- Make sure your transporter and disposal facility have EPA identification numbers.
- Use manifests for all hazardous wastes shipped off-site. Keep the manifests on-site.
- Never discard a possible hazardous waste or solvent-containing waste by throwing it on the ground or into a stormwater drain.
- If your facility uses a septic tank, never discard a possible hazardous waste or solvent-containing waste by discharging it into a floor drain, sink or toilet.

Inspections and Recordkeeping

- Inspect materials upon delivery and immediately return unacceptable materials to the supplier.
- Inspect containers, floor sealant areas, and product and waste areas at least once a week and keep a written log of these inspections.
- Keep training and inspection records for three years.
- Keep manifests and shipping receipts for three years.
- Keep lab test records for three years.
- Keep land disposal restriction forms for three years from the date the waste was last shipped.
- Keep records of leak inspections, monthly perc purchase amounts, the volume of water run through the vacuum treatment unit and the changing of filters of the aforementioned devices.

Training

- Train all employees to identify, reduce and properly handle wastes.
- Train new employees before they handle hazardous wastes.
- Involve employees in designing and implementing waste reduction measures.
- Offer periodic refresher courses to renew or increase employee awareness of the importance of waste reduction.

How can I reduce hazardous wastes?

Reducing hazardous wastes makes good business sense. Benefits include:

- Saving money on waste management costs.
- Reducing concerns about penalties and liability.
- Creating a safer, healthier workplace.
- Promoting positive public relations with clients, customers and the local community.

How do I begin?

- The manager must be committed to waste minimization and pass that commitment on to the employees.
- Evaluate your shop's wastes and identify areas where changes can be made.
- Train employees to use dry cleaning equipment correctly and efficiently, using minimal amounts of spot cleaners required to get the job done.

Solvents

- Maintain dry cleaning machines carefully and check weekly for leaks.
- Replace hazardous solvents or spotting chemicals with non-hazardous products.
- Use spigots and pumps when dispensing new solvents.
- Install secondary containment for storage tanks and containers. Keep all waste containers sealed.
- Use self-closing funnels to add waste to drums.
- Check the exhaust temperature weekly during the drying cycle. If it does not cool below 45 degrees Fahrenheit, the unit is wasting solvent and it requires maintenance.
- Examine the separator water visually. If "globules" of solvent are visible, the unit is wasting solvent. The unit requires maintenance, and may not be treated effectively by the commercial treatment.

Carbon cartridge Filters

- Drain cartridges for at least 24 hours in a closed container.
- Determine and maintain the ideal amount of clothing cleaned per cartridge before stripping cartridges.

Who needs to know if my business generates hazardous waste?

Post Emergency Information

Post the following information near every telephone:

* Fire department phone number.
* Emergency coordinator's name and phone number.
* Locations of fire alarms and extinguishers.
* Locations of spill control materials.

Notify FDEP

If your business is a small or large quantity generator, notify FDEP to obtain an EPA identification number. Local environmental agencies also should be notified.

Notify local authorities

Police and fire departments and local hospitals that would respond to an emergency need to know that there are hazardous wastes on your property.

Designate an emergency coordinator

This person must know what to do in case of fire, spill or other emergency and must be on the premises or on call 24 hours a day.

Develop a contingency plan

Guidance on contingency plans is available from FDEP. Large quantity generators must have a written plan that includes:

* Emergency response arrangements with police, fire, hospitals and emergency response contractors.
* Emergency coordinator's addressand phone number.
* On-site emergency equipment descriptions and locations.
* Evacuation plan and routes, including a site diagram.
* Spill reporting procedures.

Checklist

This checklist will help you prevent the most common hazardous waste violations. For more detailed information on hazardous waste management requirements, contact FDEP.

- ☐ Identify and record quantities of hazardous waste monthly.
- ☐ Obtain an EPA identification number, if needed.
- ☐ Use proper containers to collect and store wastes or products.
- ☐ Label all containers whether product or waste as to their contents.
- ☐ Keep all hazardous waste or products containing regulated solvents closed at all times unless actively removing from or adding to it.
- ☐ Inspect all regulated management areas.
- ☐ Train employees to manage perchloroethylene-related materials appropriately.
- ☐ Designate an emergency coordinator.
- ☐ Post emergency information near each phone.
- ☐ Develop a contingency plan for emergencies.
- ☐ Use manifests for all waste transported for disposal.
- ☐ Keep all records for at least three years.

Dos and Don'ts

DO
Keep containers closed

DON'T
Leave containers open

DO
Keep accurate inspection logs

DO
Label all containers

DON'T
Leave containers unlabeled

Tips from Inspectors

Drums

- You cannot have any mystery drums. All drums must be labeled and have a "birthdate" on them.
- Evaporation of hazardous waste is a serious violation. Do not allow the hazardous wastes to evaporate. You must keep the drum closed when you are not in the process of putting waste into the drum. You also are required to keep the top of the drum clean.
- Do not store old drums outside. If they get stormwater inside them, you will have to sample the stormwater and determine whether or not the water in the drum is hazardous. Insist that the person who sold you the drum and its contents takes the drum back when you are done with it.
- Inspectors go into dumpsters and walk the entire property line of a business. They go back into trees looking for orphan drums and distressed/dead vegetation.

Oil

- You cannot use used motor oil for weed control. Used oil containers must not leak and be in good shape. You must retain your used oil filter records for three years. The inspectors spend a lot of time on used oil inspections.

Spills

- You must clean up your spills at the time of the spill.
- Be sure to store old automotive batteries on a floor that is under a roof. Do not stack batteries. If they fall over, they will leak acid and create a spill problem.

Transport

- The only generators who are allowed to transport their own waste are conditionally exempt small quantity generators. All other generators must use a hazardous waste hauler who has a permit from the FDEP and the US EPA.

Waste

- The most common violation is the non-determination of whether or not something is a waste.
- Abandoned products are a waste.
- If you throw away containers, make sure the container is completely empty before you place it in a waste receptacle. If you throw away aerosol cans, make sure the can has a hole in it, and that you have drained the liquids out of the can. If you are throwing away paint containers, be sure to drain all the paint out of the container.

Water

- If you discharge any waste that could be construed as a hazardous waste into a city sewer, you must have the written permission of the city sewer system. The city sewer system must be a Publicly Owned Treatment Works (POTW). It cannot be a privately owned package plant.
- If you use rags, you should send the rags to a linen service that is served by a publicly owned sewage treatment plant. If you use paper towels, you must make a determination as to whether the used paper towels are a hazardous waste.
- Know where your drains go. All drains that lead from a hazardous materials area to a stormwater area should be sealed shut

Where can I get more information?

Additional information on hazardous waste reduction and regulations is available from many sources.

Florida Department of Environmental Protection

District offices and the Tallahassee office offer technical assistance, fact sheets and other publications on hazardous waste regulations.

Hazardous Waste Compliance Assistance Program
Phone: (800) 741-4DEP
(850) 245-8707
Fax: (850) 245-8810

Information about the Universal Waste rule can be found at:
http://www.dep.state.fl.us/waste/categories/mercury/pages/laws.htm or by calling (800) 741-4DEP

Available publications include:

- Summary of Hazardous Waste Regulations
- Requirements for Conditionally Exempt Small Quantity Generators
- Requirements for Small Quantity Generators
- Handbook for Small Quantity Generators of Hazardous Waste

U.S. Environmental Protection Agency

The EPA has published a series of industry-specific guidelines and handbooks on preventing pollution and complying with hazardous waste regulations.

RCRA Hotline: (800) 424-9346

Your Trade Associations

Many trade associations have published guides to help you find solutions to your hazardous waste management problems.

Florida Small Business Assistance Program

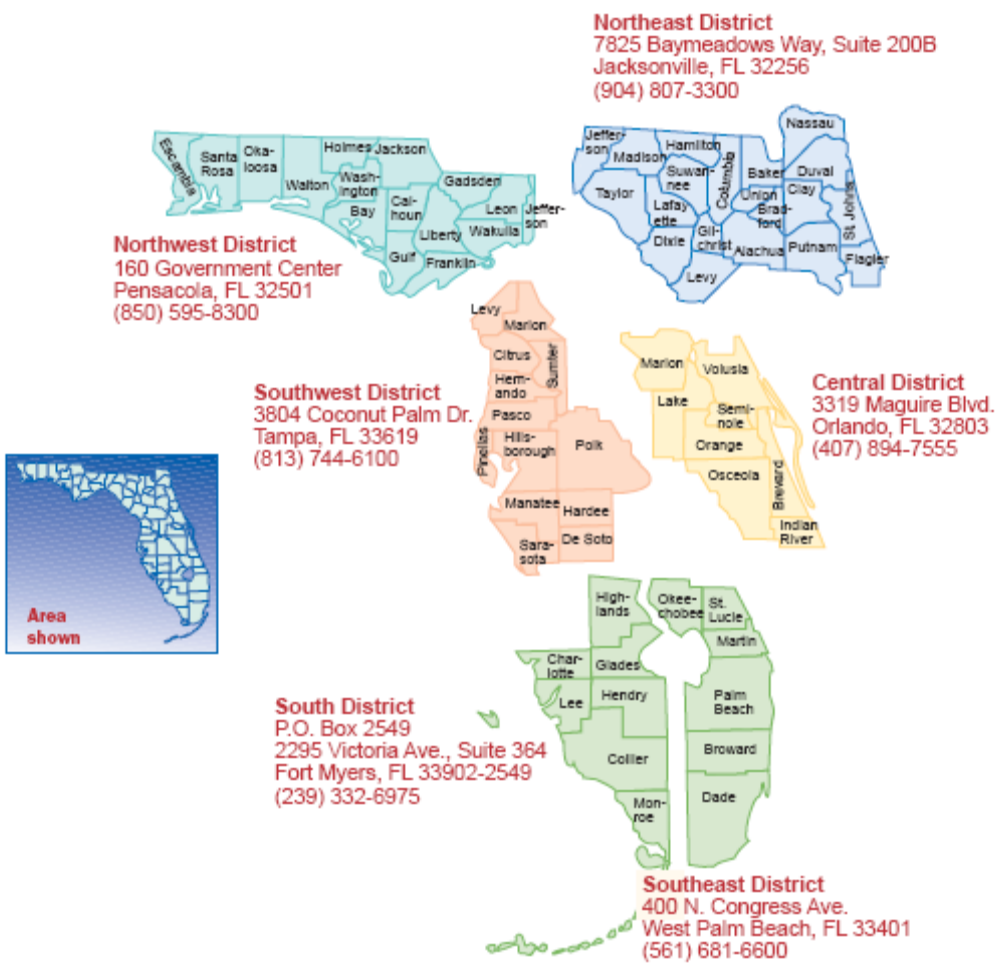
The Small Business Assist-ance Program helps businesses with environmental concerns and problems related to compliance with air regulations. Assistance is confidential and staff experts have business experience.

Phone: (800) 722-7457

This project and the preparation of this brochure was funded in part by a Section 3011 Hazardous Waste Management State Program grant from the U.S. Environmental Protection Agency (US EPA) through a contract with the Hazardous Waste Management Section of the Florida Department of Environmental Protection. The total cost of the project was $60,000, of which $45,000 or 75 percent was provided by the US EPA.

Offices of the Florida Department of Environmental Protection

Hazardous Waste Regulation Section
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, FL 32399-2400
(800) 741-4DEP



University of Florida
Florida Center for Solid and Hazardous Waste Management
2207-D N.W. 13th Street
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Appendix H **A GUIDE on HAZARDOUS WASTE MANAGEMENT for FLORIDA'S FURNITURE REFINISHERS & MANUFACTURERS**

Florida Department of Environmental Protection Hazardous Waste Compliance Assistance Program

This document was published to help educate businesses on hazardous waste management issues affecting them. The suggested options may help businesses operate in an environmentally appropriate manner. Some of the options may go beyond what is required to remain in compliance with regulations. Business owners are responsible for obtaining complete information about applicable regulations. Misrepresentations or omissions by the Florida Department of Environmental Protection or the Florida Center for Solid and Hazardous Waste Management do not relieve any person from any requirement of federal regulations or Florida law.

This document will help you with the RCRA definition:

- What is hazardous waste?
- Characteristics of wastes
- Typical hazardous wastes
- Recommended processing of waste
- How to reduce hazardous waste

These regulations are available at many public libraries. In addition, the Florida Department of Environmental Protection and the United States Environmental Protection Agency have posted links to copies of these regulations on the agencies' Internet sites:

http://www.dep.state.fl.us
http://www.epa.gov

These sites also provide access to agency forms, fact sheets, checklists, rule summaries, answers to frequently asked questions and reports from our public information databases. Individuals who do not have Internet access may obtain copies of department publications through the contact information listed on pages 18 and 19 of this document.

Revised May 2004

Why should I care about hazardous wastes?

As a business owner, operator or employee, you may be producing materials that can harm people and the environment. This booklet offers helpful tips on how to:

- Comply with federal and state hazardous waste regulations.
- Avoid penalties by properly managing hazardous wastes.
- Save money on disposal costs by reducing hazardous wastes.

Health and Environment

Hazardous wastes spilled or dumped on the ground or disposed of in dumpsters may seep into the groundwater and contaminate drinking water supplies.

Hazardous wastes may run off into the nearest body of water where they may poison or kill fish and other wildlife.

Hazardous wastes pose a risk to you, your employees and your community.

Cost Savings

State and county inspectors may visit your business to ensure that hazardous wastes are being managed properly. State penalties range from $100 to $50,000 **per violation per day**.

Reducing hazardous wastes can reduce your production and disposal costs and reduce your risk of future liability.

Public Image

Your customers will appreciate your efforts to prevent pollution.

Your community will recognize your business as a good neighbor.

What is a hazardous waste?

A waste is hazardous if:

- It is listed as a hazardous waste in the Title 40 Code of Federal Regulations (CFR) Part 261, Subpart D.
- It has any of the characteristics described below:

Characteristic Wastes

Ignitable

Ignitable wastes are flammable or spontaneously combustible. If they have a flashpoint of less than 140 degrees Fahrenheit or an alcohol content of 24% or more, they are hazardous wastes. Examples include some paints, paint solvents, other solvents and degreasers.

Corrosive

Corrosive wastes can burn the skin or corrode metals. Liquids with a pH of 2 or lower or 12.5 or higher are corrosive. Examples include lye, rust removers, acid or alkaline fluids and battery acid.

Reactive

Reactive wastes are unstable and may explode or react rapidly or violently with water or other materials. Examples include bleaches, oxidizers, cyanides and explosives, such as sodium azide and dynamite.

Toxic

Wastes are toxic if they contain certain heavy metals above specific concentrations, such as mercury, or toxic organic chemicals. Examples include some spray gun cleaners, chromium-bearing paints, paint sludges, paint scrapings and spray booth filters.

Listed Wastes

Some industrial processes and chemical wastes are listed specifically as hazardous in the federal regulations under 40 CFR 261, Subpart D. Copies of the rule can be found at many public libraries, on the Internet (http://www.gpoaccess.gov/cfr/) or may be purchased from the Government Printing Office.

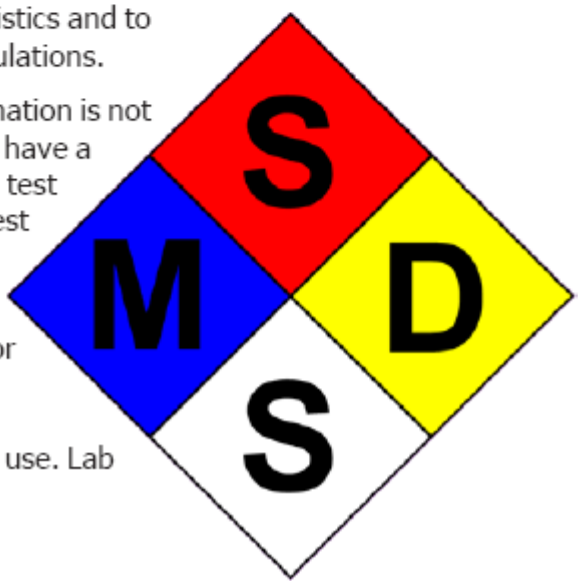
Acutely Hazardous Wastes

Small amounts of very dangerous wastes, such as arsenic and cyanide compounds, are regulated in the same way as large amounts of other wastes. A business that generates 2.2 pounds (1 kilogram) or more of these acutely hazardous wastes per month is subject to full regulation as a Large Quantity Generator (LQG, see page 10) under the hazardous waste rules.

Identifying Your Hazardous Wastes

It is very important to determine whether a waste is hazardous or non-hazardous. There are several ways to identify hazardous wastes.

- Always ask for a Material Safety Data Sheet (MSDS) before ordering any new product. The MSDS will give you valuable information about the product. Note: the MSDS does not identify chemicals present in concentrations less than 1%, or 10,000 parts per million.
- Talk to product suppliers and manufacturers.
- Read product labels.
- Compare product and process information to hazardous waste characteristics and to wastes listed in federal regulations.
- If product or process information is not available or is inconclusive, have a commercial lab sample and test the waste using the TCLP test or other appropriate analytical tests.
- A non-hazardous material or product may become a hazardous waste due to contaminants added during use. Lab testing may be necessary.



SOURCES OF HAZARDOUS WASTE

Strippers and Cleaners

Paint stripper wastes and finish stripper wastes are usually hazardous because of the stripper used. Paint sludges may contain heavy metals.

Methylene chloride (dichloromethane), the main active ingredient in most strippers, removes old paint and polyurethane. Use less toxic strippers.

Flammable solvents are often used to remove shellac, lacquers and varnishes and to wash down furniture after stripping with methylene chloride.

Lye is the active ingredient in caustic strippers. Pieces are usually rinsed with water before finishing. Lye solutions can have a pH high enough to be hazardous. Paint sludges from rinse tanks can be hazardous. Rust removers (naval jelly) and aluminum cleaners usually contain phosphoric acid. Waste waters can have a pH low enough to be hazardous.

If you are using a mechanical stripping method such as sanding, the sandings may be hazardous waste and should be collected for hazardous waste determination.

Glues, Adhesives and Fillers

Contact cement, PVC cement or laminating adhesives may contain hazardous chemicals such as trichloroethylene or tetrachloroethylene (perc). Less hazardous adhesives are available. Yellow carpenter's wood glue and white glue are non-hazardous. Fillers such as wax sticks, almond sticks and shellac sticks are non-hazardous. Epoxies are not hazardous after the components react and solidify.

Finishing Wastes

Stains can be water- or solvent-based. Wood bleaches usually contain oxalic acid. Shellac, a natural resin, becomes hazardous when mixed with flammable solvents. Oil finishes polymerize as they dry, generating heat. Soiled rags are hazardous because they can ignite spontaneously.

Some varnishes such as spar varnish have a high percentage of drying oils and a higher risk of spontaneous combustion than spirit varnishes made of resin thinned with solvent. Polyurethanes are usually thinned with solvents; less toxic water-based polyurethanes are now available.

Special Wastes

Mercury

Some antique pieces may contain mercury. Liquid mercury can give off toxic vapors and is difficult to clean up. If you have a mercury spill, call a cleanup contractor who has specialized equipment and training.

Electroplating

Specialized training is needed if you operate plating lines to resilver mirrors or refinish metal fixtures and parts. Electroplating operations may never discharge wastes into septic tanks or ponds on site. Most plating operations require a pretreatment permit from your municipal sewer system and the assistance of a professional engineer in designing the waste treatment system. Electroplating wastes almost always are regulated hazardous wastes, and they may cause your operation to be an LQG in the months you empty a process tank.

Rags

Disposable rags or paper towels used with hazardous substances should be disposed of as hazardous wastes. They should not be disposed of in a dumpster.

TYPICAL HAZARDOUS WASTES

Acetone
Benzene
Carbon tetrachloride
Chlorobenzene
Chloroform
Cresol
Ethyl benzene
Ethanol
Ethylene dichloride

Hexachloroethane
Kerosene
Methyl ethyl ketone
Methylene chloride
Pentachlorophenol
Phenol
Toluene
White spirits, Vasrol
Xylene

Dos and Don'ts

DO
keep containers closed.

DON'T
leave containers open.

HW / Used Oil Container Inspection Log

Date	Time	Inspector's Name	# of Containers	Container Condition	Observations	Date & description of discharges and cleanup

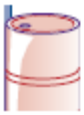
DO
keep accurate inspection logs.

DO
label all containers.

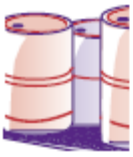
DON'T
leave containers unlabeled.

How should I manage hazardous wastes?

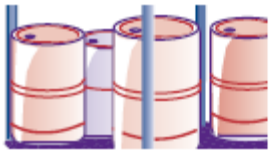
First, determine how much hazardous waste you generate **each month**. The rules you must follow depend on how much you generate, how much you store and how long you store it.



Less than 220 pounds per month (100 kilograms or about half a drum), and never accumulate more than 2,200 pounds (1,000 kg) at any time: you are a "Conditionally Exempt Small Quantity Generator" (CESQG).



220 -2,200 pounds per month (100-1,000 kilograms or about half a drum to 5 drums): you are a "Small Quantity Generator" (SQG).



More than 2,200 pounds per month (1,000 kilograms or more than about 5 drums): you are a "Large Quantity Generator" (LQG).

The following practices may be required for your business. Even if they are not required, they are good waste management practices. Additional information is available from FDEP.

Containers

- Maintain containers in good condition. Prevent leaks, ruptures and accumulation of rainwater on tops of drums.
- If a container leaks, transfer waste to a new container.
- Keep containers closed. Use self-closing funnels when adding waste. Do not allow wastes to evaporate; this is a serious offense.
- Wastes must be compatible with the container. For example, use HDPE plastic containers for corrosive wastes.
- Never place incompatible wastes, such as wastes that react with each other (e.g., acids and bases), in the same container.

Storage

- Maintain adequate aisle space between container rows to allow inspection for leaks and damages.
- Store ignitable and reactive wastes at least 50 feet from property boundaries.
- Store containers with incompatible wastes in separate areas.
- Time limit for SQGs is 180 days and 90 days for LQGs.

- For some hazardous material containers, secondary containment pallets or platforms may be a cost-effective option for spill-prevention.

Labels

HAZARDOUS WASTE
Federal Law Prohibits Improper Disposal
If found, please contact the nearest police, public safety authority or the US EPA
(Your business name, address and manifest document number)

- The above label represents proper wording for a hazardous waste label. You must also comply with Florida Department of Transportation requirements.
- Label every container with the type of waste and whether it is hazardous or non-hazardous.
- Include the accumulation start date (the date when waste was first placed in the container).
- Include your company name and address.
- Include federal waste code numbers.

Transport and Disposal

- Make sure your transport and disposal facilities have US EPA identification numbers.
- Use manifests for all hazardous wastes shipped off-site. Keep the manifests on-site.

Inspections and Recordkeeping

- Inspect containers at least once a week and keep a written log of container inspections.
- Keep a record of larger spills and use this information to identify the spill prevention options that might help your company.
- Keep training and inspection records for three years.
- Keep manifests and shipping receipts for three years.
- Keep records of lab tests for three years.
- Keep land disposal restriction forms for three years from the date the waste was last shipped.

How can I reduce hazardous wastes?

Reducing hazardous wastes in your shop makes good business sense. Benefits include:

- Saving money on waste management costs.
- Reducing concerns about penalties and liability.
- Creating a safer, healthier workplace.
- Promoting positive public relations with clients, customers and the local community.

How do I begin?

- Make a commitment to reducing wastes in every area of your business.
- Evaluate your shop's wastes and identify areas where changes can be made.
- Encourage the participation of all employees through education, training and incentives.

Solvents

- Reduce or eliminate solvent use by determining whether cleaning is really necessary.
- Use a multi-purpose solvent to reduce the types of hazardous waste that need to be managed.
- Find less hazardous substitutes for solvents, such as citrus-based, water-based or detergent-based cleaners.
- Replace solvents only when necessary.
- Use spigots and pumps to transfer thinners from storage drums to containers.
- Use drip pans under drum spigots.
- Use a two-stage cleaning process (dirty solvent followed by clean rinse) to reduce solvent usage.
- Contract with recycling services for thinners and other solvents.
- Use self-closing funnels to add waste to containers.

Finishes

- Replace hazardous finishes with non-hazardous or less hazardous finishes.
- Use mechanical stripping methods, such as sanding or heat guns, instead of stripping chemicals.
- Drain unused paints or stains back into the original containers for reuse, filtering if necessary.
- In high volume painting operations, use HVLP spray guns to reduce paint overspray and paint usage.

Shop Practices

- Minimize inventory and use a "first-in, first-out" system to prevent the need for disposal of old unused materials.
- Store raw materials and wastes in closed containers in a covered area protected from rain and sunlight.
- Prevent leaks and spills. Keep floors clean.
- Strip in a contained area to prevent discharges of potentially hazardous waste.
- For dirty rags, use an approved linen service that discharges its water to a publicy owned sewer system.
- Do not discharge wastes to the ground surface or to floor drains.

Training

- Train all personnel to identify, reduce and properly handle wastes.
- Train employees to use solvents, finishes and other chemicals efficiently, using minimal amounts to get the job done.
- Train new employees before they handle hazardous wastes.
- Training must cover hazardous waste management; OSHA and Right-to-Know training alone are not sufficient.
- Training must be documented. Some ways to document include the use of sign-in sheets and completion certificates.
- Make pollution prevention everyone's responsibility.

Tips from Inspectors

Drums

- You cannot have any mystery drums. All drums must be labeled and have a "birthdate" on them.
- Evaporation of hazardous waste is a serious violation. Do not allow the hazardous waste to evaporate. When you are not in the process of putting waste into the drum, you must keep it closed.
- You also are required to keep the top of the drum clean.
- Do not store old drums outside. If they get stormwater inside them, you will have to sample the stormwater and determine whether the water in the drum is hazardous. Insist that the person who sold you the drum and its contents takes the drum back when you are done with it.

- Inspectors go into dumpsters and walk the entire property line of a business. They go back into trees looking for orphan drums and distressed/dead vegetation.

Spills

- Clean up your spills at the time of the spill.

Transport

- The only generators who are allowed to transport their own waste are conditionally exempt small quantity generators. All other generators must use a hazardous waste hauler that has registered with the FDEP and the US EPA.

Waste

- The most common violation occurs with waste determination.
- Abandoned products are wastes.
- If you throw away containers, make sure the container is completely empty before you place it in a waste receptacle. Aerosol cans may be disposed of as hazardous waste in lab pack containers. You may also purchase a device which allows the cans to be punctured and drained safely. Empty cans may then be disposed of in the trash, while the contents may either be used or disposed of as waste.

Water

- If you discharge any waste that could be construed as a hazardous waste into a city sewer, you must have written permission of the city sewer system. The city sewer system must be a Publicly Owned Treatment Works (POTW). It cannot be a privately owned package plant.
- If you use rags, you should send the rags to a linen service that is served by a publicly-owned sewage treatment plant. If you use paper towels, you must make a determination as to whether the used paper towels are hazardous waste.
- Know where your drains go. All drains that lead from a hazardous materials area to a stormwater area should be sealed shut.

Who needs to know if my business generates hazardous waste?

Post Emergency Information

Post the following information near every telephone:

- Fire department phone number.
- Emergency coordinator's name and phone number.
- Locations of fire alarms and extinguishers.
- Locations of spill control materials.

Notify FDEP

If your business is a small or large quantity generator, notify FDEP to obtain a US EPA identification number. Local environmental agencies also should be notified.

Notify local authorities

Police and fire departments and local hospitals that would respond to an emergency need to know that hazardous wastes are on your property.

Designate an emergency coordinator

This person must know what to do in case of fire, spill or other emergency and must be on the premises or on call 24 hours a day.

Develop a contingency plan

Guidance on contingency plans is available from FDEP. Large quantity generators must have a written plan that includes:

- Emergency response arrangements with police and fire departments, hospitals and emergency response contractors.
- Emergency coordinator's address and phone number.
- On-site emergency equipment descriptions and locations.
- Evacuation plan and routes, including a site diagram.
- Spill reporting procedures.

Smaller generators (SQGs and CESQGs) should also have a contingency plan.

Checklist

This checklist will help you prevent the most common hazardous waste violations. For more detailed information on hazardous waste management requirements, contact FDEP.

- ☐ Each month, identify and record types and quantities of hazardous wastes.
- ☐ Notify FDEP and obtain a US EPA identification number.
- ☐ Use proper containers to collect and store wastes.
- ☐ Label all containers, whether product or waste, as to their contents.
- ☐ Include accumulation start dates on labels for each container.
- ☐ Keep all containers of hazardous waste or products containing regulated solvents closed at all times unless actively removing from or adding to them.
- ☐ Maintain aisle space between containers for inspection.
- ☐ Inspect containers weekly for rust, leaks or damage and keep a log.
- ☐ Never discharge hazardous wastes to a septic tank.
- ☐ Train employees to properly handle hazardous wastes.
- ☐ Designate an emergency coordinator.
- ☐ Notify police, hospitals and fire department.
- ☐ Post emergency information near each phone.
- ☐ Develop a contingency plan for emergencies.
- ☐ Use manifests for all waste transported for disposal.
- ☐ Keep all records for at least three years.

Where can I get more information?

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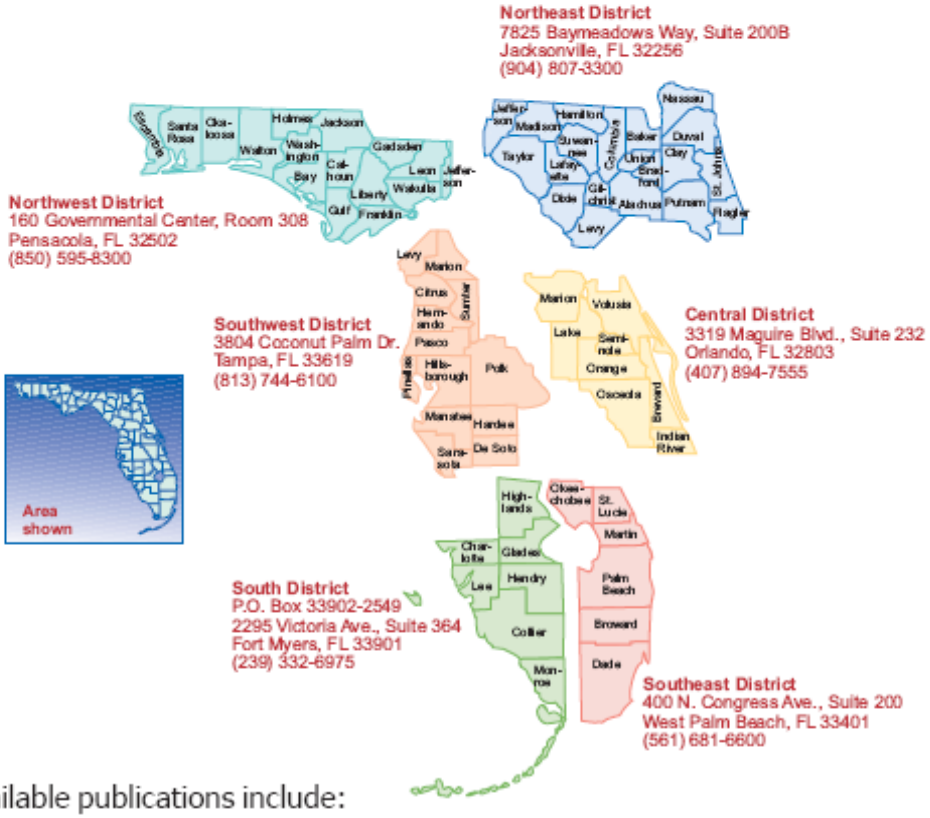

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http://www.dep.state.fl.us/air/programs/sbap.htm

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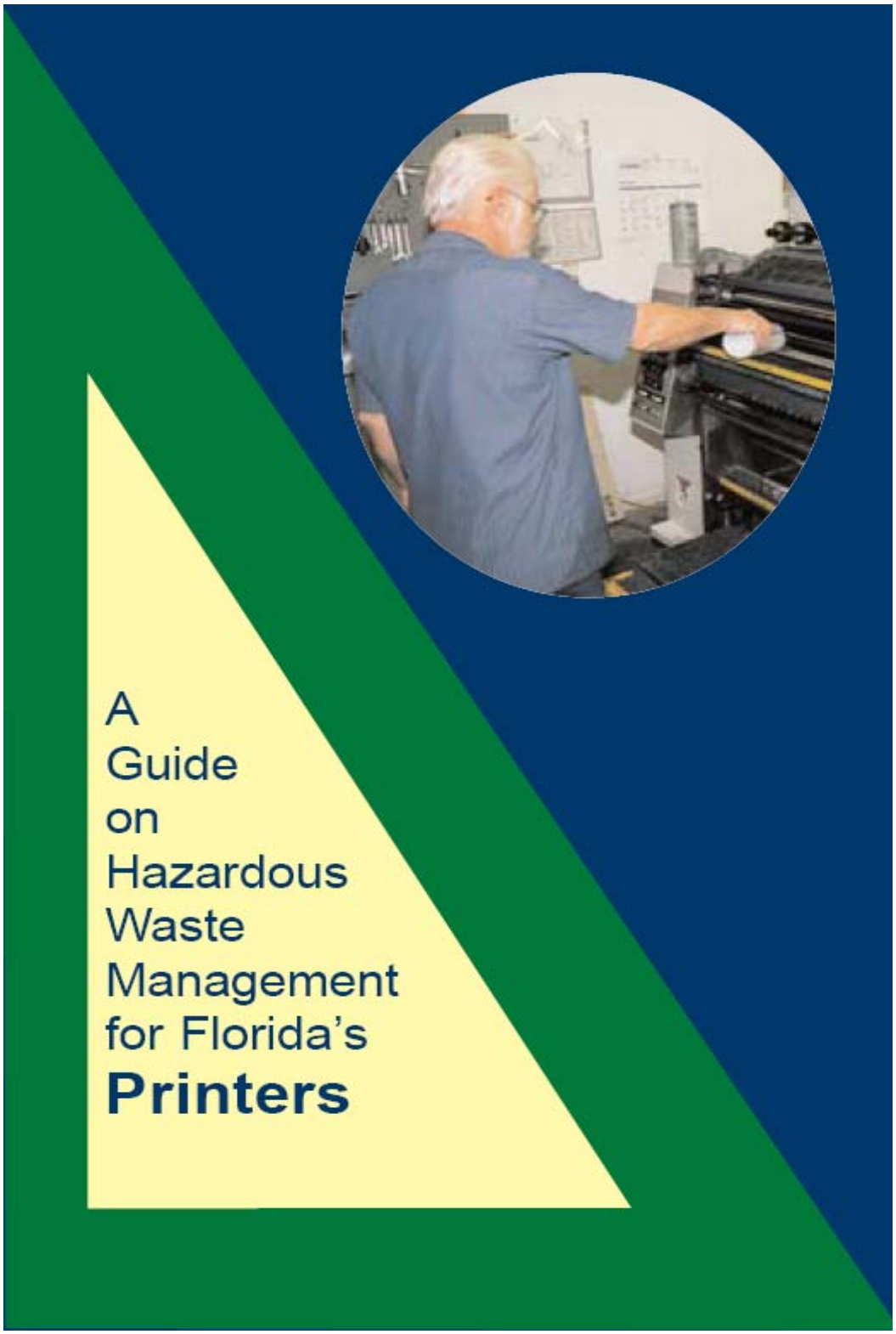
Appendix I **A GUIDE on HAZARDOUS WASTE MANAGEMENT for FLORIDA'S PRINTERS**



Florida Department of Environmental Protection Hazardous Waste Compliance Assistance Program

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These regulations are available at many public libraries. In addition, the Florida Department of Environmental Protection and the United States Environmental Protection Agency have posted links to copies of these regulations on the agencies' Internet sites:

http://www.dep.state.fl.us
http://www.epa.gov

These sites also provide links to agency forms, fact sheets, checklists, rule summaries, answers to frequently asked questions and reports from our public information databases. Individuals who do not have Internet access may obtain copies of department publications through the contact information listed on page 16 of this document.

Revised 6/2002

Why should I care about hazardous wastes?

As a business owner, operator or employee, you may be producing materials that can harm people and the environment. This booklet offers helpful tips on how to:

- Comply with federal and state hazardous waste regulations.
- Avoid penalties by properly managing hazardous wastes.
- Save money on disposal costs by reducing hazardous wastes.

Health and Environment

Hazardous wastes spilled or dumped on the ground or disposed in dumpsters may seep into the groundwater and contaminate drinking water supplies.

Hazardous wastes may run off into the nearest body of water where they may poison or kill fish and other wildlife.

Hazardous wastes pose a health risk to you, your employees and your community.

Cost Savings

State and county inspectors may visit your business to ensure that hazardous wastes are being managed properly. State penalties range from $100 to $50,000 **per violation per day**.

Reducing hazardous wastes can reduce your production and disposal costs and reduce your risk of future liability.

Public Image

Your customers will appreciate your efforts to prevent pollution.

Your community will recognize your business as a good neighbor.

What is a hazardous waste?

A waste is hazardous if:

- it is listed as a hazardous waste in Title 40 Code of Federal Regulations (CFR) Part 261, Subpart D.
- it has any of the characteristics described below:

Characteristic Wastes

Ignitable

Ignitable wastes are flammable or spontaneously combustible. If they have a flashpoint of 140 degrees Fahrenheit or less, they are a hazardous waste. Examples include alcohol blanket washes, petroleum solvents and some contaminated rags.

Corrosive

Corrosive wastes can burn the skin or corrode metals. Liquids with a pH of 2 or lower or 12.5 or higher are corrosive. Some corrosive liquids can have a more neutral pH, such as ferric chloride etchant or amine-based cleaners.

Reactive

Reactive wastes are unstable and may explode or react violently with water or other materials.

Toxic

Wastes are toxic if they contain certain heavy metals above specific concentrations, such as chromium, dichromate hardeners, lead or cadmium, or toxic organic chemicals. Examples include silver-bearing wastes with a Toxicity Characteristic Leaching Procedure value above 5.

Listed Wastes

Some industrial processes and chemical wastes are listed specifically as hazardous in the federal regulations under 40 CFR 261, Subpart D. Some spent solvent wastes used in the printing industry like methylene chloride and tetrachloroethene are listed. Copies of the rule can be found at many public libraries, on the Internet or may be purchased from the Government Printing Office.

Acutely Hazardous Wastes

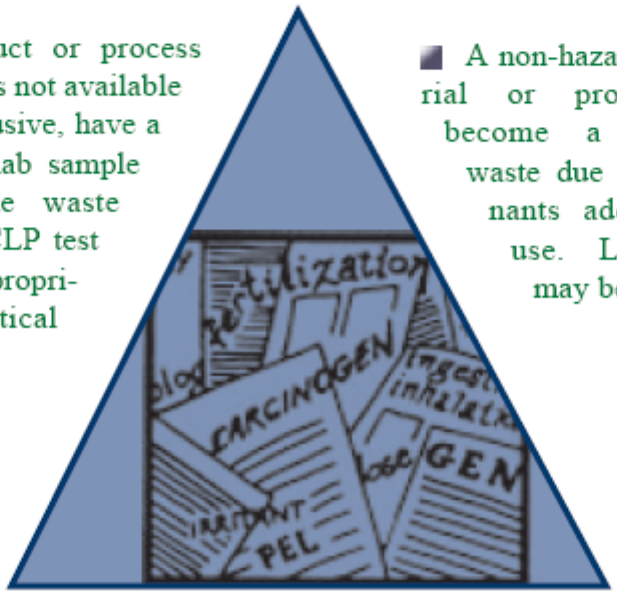
Small amounts of very dangerous wastes, such as arsenic and cyanide compounds, are regulated in the same way as large amounts of other wastes. A business that generates 2.2 pounds (1 kilogram) or more of these acutely hazardous wastes per month is subject to full regulation under the hazardous waste rules.

Identifying Your Hazardous Wastes

It is very important to determine whether a waste is hazardous or non-hazardous. There are several ways to identify hazardous wastes:

- Obtain and read Material Safety Data Sheets (MSDS).
- Talk to product suppliers and manufacturers.
- Read product labels.
- Compare product and process information to hazardous waste characteristics and to wastes listed in federal regulations.

- If product or process information is not available or is inconclusive, have a commercial lab sample and test the waste using the TCLP test or other appropriate analytical tests.



- A non-hazardous material or product may become a hazardous waste due to contaminants added during use. Lab testing may be necessary.

Sources of Hazardous Waste

Waste Inks

Determine whether waste inks are hazardous, or assume they are hazardous and dispose of them as hazardous wastes. Consider using less toxic inks with low metal concentrations, vegetable oil-based inks and water-based inks.

Spent Solvents

Many spent solvents are considered hazardous wastes because they are ignitable or toxic. Segregate spent solvents and recycle them. To reduce hazardous waste disposal costs and air emissions, use solvents that are less hazardous or non-hazardous.

Fixers

Untreated spent fixer is likely to be a hazardous waste and to exceed local sewer discharge limits for silver. Fixer should be treated on-site or off-site and should never be discharged to a septic tank unless you have a permit from FDEP.

Shop Towels and Wipes

Shop towels are hazardous wastes when they are contaminated with solvents that contain hazardous chemicals. They can be disposed as a hazardous waste, or a towel service may be used. If you use a towel service, make sure the company discharges its wastewater to a sanitary sewer. Used disposable wipes that are contaminated with listed spent solvents or substances that cause the wipes to be characteristically toxic should be disposed of as hazardous wastes.

Aerosol Cans

Spray cans used in screen printing may contain hazardous chemicals, such as 1,1,1-trichloroethane or toluene. Empty aerosol cans may be thrown in the trash only if all the contents have been removed completely.

Containers

Keep used ink containers covered to prevent skin formation and rag storage containers covered to reduce emissions.

Who needs to know if my business generates hazardous waste?

Post Emergency Information

Post the following information near every telephone:

* Fire department phone number.
* Emergency coordinator's name and phone number.
* Locations of fire alarms and extinguishers.
* Locations of spill control materials.

Notify FDEP

If your business is a small or large quantity generator, notify FDEP to obtain an EPA identification number. Local environmental agencies also should be notified.

Notify local authorities

Police and fire departments and local hospitals that would respond to an emergency need to know that there are hazardous wastes on your property.

Designate an emergency coordinator

This person must know what to do in case of fire, spill or other emergency and must be on the premises or on call 24 hours a day.

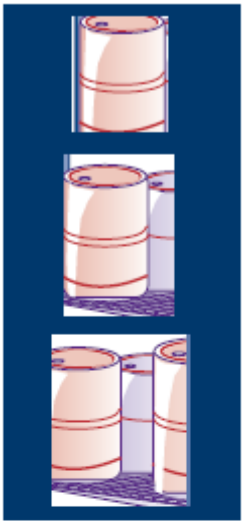
Develop a contingency plan

Guidance on contingency plans is available from FDEP. Large quantity generators must have a written plan that includes:

* Emergency response arrangements with police, fire, hospitals and emergency response contractors.
* Emergency coordinator's address and phone number.
* On-site emergency equipment descriptions and locations.
* Evacuation plan and routes, including a site diagram.
* Spill reporting procedures.

How should I manage hazardous wastes?

First, determine how much hazardous waste you generate **each month**. The rules you must follow depend on how much you generate, how much you store and how long you store it.



Less than 220 pounds (100 kilograms or about half a drum): you are a "Conditionally Exempt Small Quantity Generator."

220 - 2,200 pounds (100-1,000 kilograms or about half a drum to 5 drums): you are a "Small Quantity Generator."

More than 2,200 pounds (1,000 kilograms or more than about 5 drums): you are a "Large Quantity Generator."

The following practices may be required for your business. Even if they are not required, they are good waste management practices. Additional information is available from FDEP.

Containers

- Maintain containers in good condition. Prevent leaks, ruptures and accumulation of rainwater on tops of drums.
- If a container leaks, transfer waste to a new container.
- Keep containers closed. Use self-closing funnels when adding waste. Do not allow wastes to evaporate.
- Wastes must be compatible with the container. For example, use HDPE plastic containers for corrosive wastes.
- Never place incompatible wastes, such as wastes that react with each other (e.g., acids and bases) in the same container. Elementary neutralization is okay (e.g., acids and cyanides).

Storage

- Maintain adequate aisle space between container rows to allow inspection for leaks and damages.
- Store ignitable and reactive wastes at least 50 feet from property boundaries.
- Store containers with incompatible wastes in separate areas.
- Time limit for SQGs is 180 days and 90 days for LQGs.

Labels

- The above label represents proper wording for a hazardous waste label. You must also comply with DOT.
- Label every container with the type of waste and whether it is hazardous or non-hazardous or used oil.
- Include the accumulation start date (the date when waste was first placed in the drum).

Transport and Disposal

- Make sure your transporter and disposal facility have EPA identification numbers.
- Use manifests for all hazardous wastes shipped off-site. Keep the manifests on-site.
- Include your business name and address.
- Include federal waste code numbers.

Inspections and Recordkeeping

- Inspect containers at least once a week and keep a written log of container inspections.
- Keep training and inspection records for three years.
- Keep manifests and shipping receipts for three years.
- Keep records of tests for three years.
- Keep land disposal restriction forms for three years from the date the waste was last shipped.

Training

- Train all employees to identify and reduce waste streams and how to properly handle wastes.
- Train new employees before they handle hazardous wastes.
- Employees should be made aware of the importance of pollution prevention.

How can I reduce hazardous wastes?

Reducing hazardous wastes makes good business sense. Benefits include:

- Saving money on waste management costs.
- Reducing concerns about penalties and liability.
- Creating a safer, healthier workplace.
- Promoting positive public relations with clients, customers and the local community.

How do I begin?

- Make a commitment to reducing wastes in every area of your business.
- Evaluate your shop's wastes and identify areas where changes can be made.
- Encourage the participation of all employees through education, training and incentives.

Solvents

- Use washout booths to collect spent solvents from cleaning.
- Use filtration systems to remove waste and increase recycling.
- Use distillation units to facilitate recycling and reuse of spent solvents.
- Store solvents away from heat.
- Install a solvent ink filter to prolong the life of a solvent.
- Limit the amount of solvent that can be applied to cleaning rags.
- Develop a procedure for removing solvent from rags before disposal.
- Use properly fitting pumps on solvent containers to minimize spills and evaporation.
- Use a two-stage cleaning process, using dirty solvent followed by a clean rinse to reduce solvent usage.
- Avoid using listed solvents (EPA wastes F001 to F005) with disposable wipes.
- Consider replacing solvent-based platemaking system with a water-based platemaking system.
- Use a non-site system that recovers silver from photoprocessing waste.
- Consider using UV-based inks.
- Use soap or detergents in lieu of solvents whenever possible.

Purchasing

- Reject free samples to reduce extra disposal costs.
- Purchase inks in containers that can be refilled by the supplier.
- Look for substitutes for toxic solvents.
- Avoid inks containing heavy metal pigments.

Chemical Management

- Follow manufacturers' directions on storing chemicals that are sensitive to light and temperature.
- Avoid overstocking to reduce expired materials.
- Ask vendors for non-hazardous developers and finishers and non-hazardous chemical substitutes for intensifiers and reducers that contain mercury or cyanide salts.
- Recycle or reduce paper wastes as much as possible.
- Segregate wastes to increase recyclability.

Inventory

- Minimize inventory and use a "first-in, first-out" system to prevent the need for disposal of old unused materials.
- Maintain accurate logs of chemicals and materials in stock.
- Keep containers clearly marked.

Checklist

This checklist will help you prevent the most common hazardous waste violations. For more detailed information on hazardous waste management requirements, contact FDEP.

- ☐ Identify and record quantities of hazardous waste monthly.
- ☐ Obtain an EPA identification number, if needed.
- ☐ Use proper containers to collect and store wastes or products.
- ☐ Label all containers whether product or waste as to their contents.
- ☐ Keep all hazardous waste or products containing regulated solvents closed at all times unless actively removing from or adding to it.
- ☐ Inspect all regulated management areas.
- ☐ Designate an emergency coordinator.
- ☐ Post emergency information near each phone.
- ☐ Develop a contingency plan for emergencies.
- ☐ Use manifests for all waste transported for disposal.
- ☐ Keep all records for at least three years.

Dos and Don'ts

DO
Keep containers closed

DON'T
Leave containers open

DO
Keep accurate inspection logs

DO
Label all containers

DON'T
Leave containers unlabeled

Tips from Inspectors

Drums

- You cannot have any mystery drums. All drums must be labeled and have a "birthdate" on them.
- Evaporation of hazardous waste is a serious violation. Do not allow the hazardous wastes to evaporate. You must keep the drum closed when you are not in the process of putting waste into the drum. You also are required to keep the top of the drum clean.
- Do not store old drums outside. If they get stormwater inside them, you will have to sample the stormwater and determine whether or not the water in the drum is hazardous. Insist that the person who sold you the drum and its contents takes the drum back when you are done with it.
- Inspectors go into dumpsters and walk the entire property line of a business. They go back into trees looking for orphan drums and distressed/dead vegetation.

Oil

- You cannot use used motor oil for weed control. Used oil containers must not leak and must be in good condition. You must retain your used oil filter records for three years. The inspectors spend a lot of time on used oil inspections.

Spills

- You must clean up your spills at the time of the spill.
- Be sure to store old automotive batteries on a floor that is under a roof. Do not stack batteries. If they fall over, they will leak acid and create a spill problem.

Transport

- The only generators who are allowed to transport their own waste are conditionally exempt small quantity generators. All other generators must use a hazardous waste hauler who has a permit from the FDEP and the US EPA.

Waste

- The most common violation is the non-determination of whether or not something is a waste.
- Abandoned products are a waste.
- If you throw away containers, make sure the container is completely empty before you place it in a waste receptacle. If you throw away aerosol cans, make sure the can has a hole in it, and that you have drained the liquids out of the can. If you are throwing away paint containers, be sure to drain all the paint out of the container.

Water

- If you discharge any waste that could be construed as a hazardous waste into a city sewer, you must have the written permission of the city sewer system. The city sewer system must be a Publicly Owned Treatment Works (POTW). It cannot be a privately owned package plant.
- If you use rags, you should send the rags to a linen service that is served by a publicly owned sewage treatment plant. If you use paper towels, you must make a determination as to whether the used paper towels are a hazardous waste.
- Know where your drains go. All drains that lead from a hazardous materials area to a stormwater area should be sealed shut.

Where can I get more information?

Additional information on hazardous waste reduction and regulations is available from many sources.

Florida Department of Environmental Protection

District offices and the Tallahassee office offer technical assistance, fact sheets and other publications on hazardous waste regulations.

Hazardous Waste Compliance Assistance Program
Phone: (800) 741-4DEP
(850) 245-8707
Fax: (850) 245-8810

Information about the Universal Waste rule can be found at:
http://www.dep.state.fl.us/waste/categories/mercury/pages/laws.htm
or by calling (800) 741-4DEP

Available publications include:
- Summary of Hazardous Waste Regulations
- Requirements for Conditionally Exempt Small Quantity Generators
- Requirements for Small Quantity Generators
- Handbook for Small Quantity Generators of Hazardous Waste

U.S. Environmental Protection Agency

The EPA has published a series of industry-specific guidelines and handbooks on preventing pollution and complying with hazardous waste regulations.

RCRA Hotline: (800) 424-9346

Florida Small Business Assistance Program

The Small Business Assist-ance Program helps businesses with environmental concerns and problems related to compliance with air regulations. Assistance is confidential and staff experts have business experience.

Phone: (800) 722-7457

Florida Printers' Compliance Alliance

The Florida Printers' Compliance Alliance is a proposed partnership of industry and government. The Compliance Alliance Program (CAP) is being designed to provide printers with assistance in understanding environmental requirements and implementing pollution prevention techniques. CAP has developed a workbook to help printers incorporate cheaper, cleaner and smarter practices in their daily operations. For a copy of the workbook or for additional information call:

- Printing Association of Florida (800) 331-0461

Your Trade Associations

Many trade associations have published guides to help you find solutions to your hazardous waste management problems. Information is available from the following organizations:

- Flexographic Technical Association (FTA)
  (631) 737-6020
  www.fta-ffta.org

- Graphic Arts Technical Foundation(GATF)
  (800) 910-GATF
  www.gatf.lm.com

- Gravure Association of America (GAA)
  (716) 436-2150
  www.gaa.org

- Printing Association of Florida (PAF)
  (800) 331-0461
  www.pafgraf.org

- Screenprinting and Graphic Imaging Association International (SGIA)
  (888) 385-3588
  www.sgia.org

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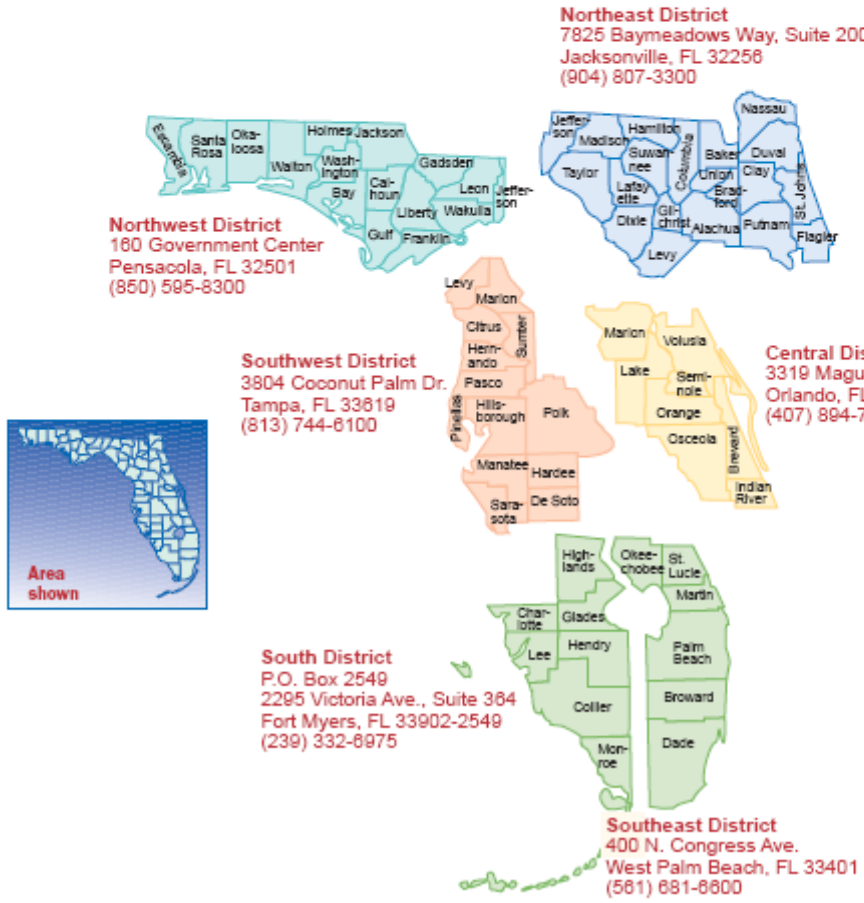

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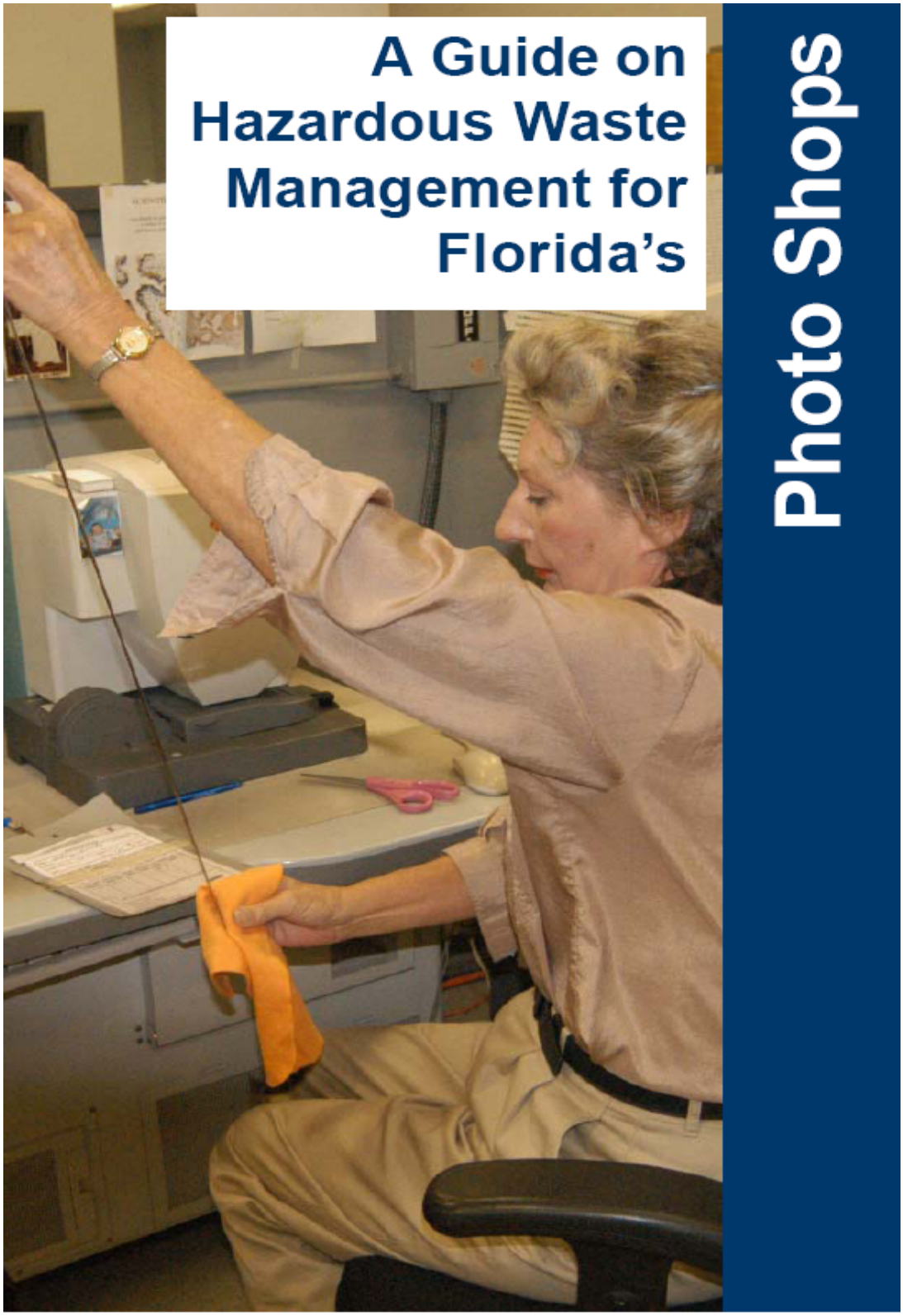
Appendix J **A GUIDE on HAZARDOUS WASTE MANAGEMENT for FLORIDA'S PHOTO SHOPS**



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This document will help you with the RCRA definition:

- What is hazardous waste?
- Characteristics of wastes
- Typical hazardous wastes
- Recommended processing of waste
- How to reduce hazardous waste

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Revised May 2004

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Ignitable wastes are flammable or spontaneously combustible. If they have a flashpoint of less than 140 degrees Fahrenheit or an alcohol content of 24% or more, they are hazardous wastes. Examples include film cleaners, mounting glues and adhesives, some types of alcohol, waste paints and solvents.

Corrosive

Corrosive wastes can burn the skin or corrode metals. Liquids with a pH of 2 or lower or 12.5 or higher are corrosive. Examples include concentrated bleaches and stabilizers and other old and expired chemicals.

Reactive

Reactive wastes are unstable and may explode or react rapidly or violently with water or other materials. Reactive wastes are not generally used in photo chemistry.

Toxic

Wastes are toxic if they contain certain heavy metals above specific concentrations, such as chromium, lead, mercury or silver, or toxic organic chemicals. Examples include waste fixers, washless stabilizers, low flow washes, rack and system cleaners (chromium-based).

Listed Wastes

Some industrial processes and chemical wastes are listed specifically as hazardous in the federal regulations under 40 CFR 261, Subpart D. Copies of the rule can be found at many public libraries, on the Internet (http://www.gpoaccess.gov/cfr/) or may be purchased from the Government Printing Office.

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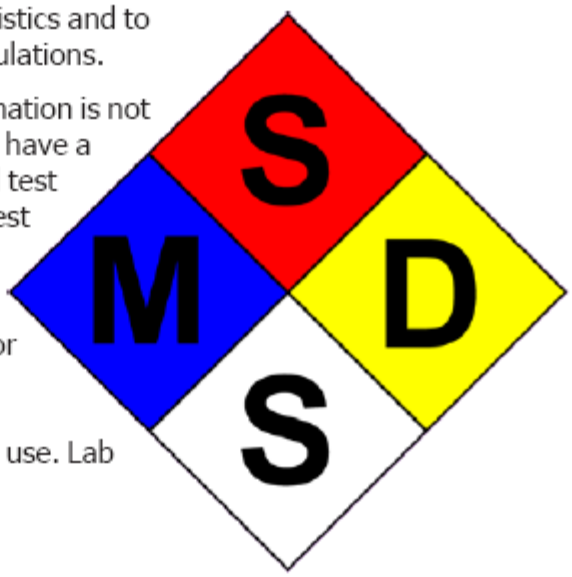
Small amounts of very dangerous wastes, such as arsenic and cyanide compounds, are regulated in the same way as large amounts of other wastes. A business that generates 2.2 pounds (1 kilogram) or more of these acutely hazardous wastes per month is subject to full regulation as a Large Quantity Generator (LQG, see page 12) under the hazardous waste rules.

Identifying Your Hazardous Wastes

It is very important to determine whether a waste is hazardous or non-hazardous. There are several ways to identify hazardous wastes.

- Always ask for a Material Safety Data Sheet (MSDS) before ordering any new product. The MSDS will give you valuable information about the product. Note: the MSDS does not identify chemicals present in concentrations less than 1%, or 10,000 parts per million.
- Talk to product suppliers and manufacturers.
- Read product labels.
- Compare product and process information to hazardous waste characteristics and to wastes listed in federal regulations.
- If product or process information is not available or is inconclusive, have a commercial lab sample and test the waste using the TCLP test or other appropriate analytical tests.
- A non-hazardous material or product may become a hazardous waste due to contaminants added during use. Lab testing may be necessary.



SOURCES OF HAZARDOUS WASTE

Processing Chemicals and Washes

Waste fixers, system cleaners, low flow washes and washless stabilizers may be hazardous due to heavy metals or organic chemicals they may contain. For example, waste fixers and stabilizers may contain hazardous levels of silver. Prior to disposal, determine whether waste fluids are hazardous.

Solvents

Common solvents used for cleaning film, work surfaces and equipment may contain hazardous substances. For example, film cleaners may contain trichloroethylene, a listed hazardous waste, or they may be hazardous due to flammability. Before disposal, determine whether solvent waste is hazardous.

Photographic Film

Undeveloped photographic film contains high concentrations of silver. Before disposing of undeveloped film waste, take the proper steps to remove the silver from the film. Film ends and tabs can be soaked in waste fixer to remove the silver from the film before disposal.

Black and white film and x-rays do contain residual levels of silver after developing. Before disposing of these negatives, contact a film recycling contractor for reclamation of the residual silver and the film.

Properly developed color negative film and prints do not contain residual levels of silver and can be properly disposed of with other solid waste. Large quantities of negatives can be cost-effectively recycled through film manufacturers' reclamation programs.

Silver Recovery Units

Two popular methods of silver recovery produce wastes and effluents that are hazardous. Wastes sent to a contractor for reclamation or recycling are exempt from hazardous waste regulations. It is important to properly maintain silver recovery units.

Electrolytic recovery units cause silver to collect on electrolytic cathodes. The silver can be recycled and the desilvered fixer can generally be discharged to a sewer or reused. Provide written notification to your sewer authority before discharging. Care must be taken to prevent the formation of sulfides. Silver concentrations in the effluent may be high.

Metallic replacement or chemical replacement cartridges form a silver sludge that may be reclaimed. Silver concentration in the effluent is high unless two units are in series.

Batteries

Many photo shops recycle batteries for their customers. Rechargeable nickel-cadmium batteries, lead-acid batteries, lithium cells, mercury-oxide button batteries and other alkaline button cell batteries can be recycled. Most manufacturers and suppliers have take-back programs for batteries. If batteries are not recycled, determine whether they are hazardous prior to disposal.

Mercury-Containing Lamps and Devices

Spent fluorescent tubes, quartz-mercury studio lights and some flash bulbs may be hazardous due to their mercury content. Recycling contractors can recycle many bulbs and devices. If the items are broken, they may need to go to a hazardous waste contractor. Mercury-containing items cannot go to solid waste incinerators and should not go to landfills.

Aerosol Cans

Empty aerosol cans that contained hazardous paints, dyes or solvents may be thrown in the trash only if punctured and all the contents have been removed as completely as possible.

Wastewater

Waste processing chemicals and washes or wastewaters from metal recovery units should never be discharged to the ground or to a septic tank system. Waste processing chemicals, wastewater, etc. should be discharged only to a sanitary sewer system with written permission from your local sewer authority.

Substances commonly used in photo processing and subject to wastewater regulations include:

- ammonia
- silver
- iron
- sulfites/sulfates
- formaldehyde
- heavy metals, especially cadmium, chromium and zinc

Fixers, washless stabilizers and other silver-rich wastewater should undergo silver recovery before being discharged to a sanitary sewer system. It may be necessary to contract with a licensed photographic wastes disposal company to properly dispose of your silver-rich solutions.

Check with your local sewer authority to determine the allowable limit for silver in your discharge. Some Florida cities have very low limits. Know the limits for your area.

Rags and Paper Towels

Rags and paper towels are hazardous waste when they are contaminated with solvents that contain hazardous substances. Rags can be disposed of as hazardous waste, or cleaned by a linen service that discharges its water to a sanitary sewer system.

TYPICAL HAZARDOUS WASTES

Heavy Metals in Processing Chemicals
Chromium
Lead
Mercury
Selenium
Silver

Recovered Silver
Flake silver
Silver cartridges
Ion-exchanged resins
Silver precipitates

Caustics and Acids
Acetic acid
Ammonium hydroxide
Chromic acid
Hydrochloric acid
Nitric acid
Oxalic acid
Phosphoric acid
Sodium hydroxide
Sulfuric acid

Process Solution Wastes
Reversal bleaches
Bleaches
Fixes
Low-flow washes
Washless stabilizers

Solvents
Acetone
Ethyl alcohol
Isopropyl alcohol
Methyl alcohol
Methyl ethyl ketone
Methylene chloride
Naptha
Petroleum distillates
Toluene
1,1,1-Trichloroethane
1,1,2-Trichloroethane
Trichloroethylene
Xylene

For more information on hazardous wastes, contact FDEP. (See page 21 for FDEP phone numbers.)

Dos and Don'ts

DO keep containers closed.

DON'T leave containers open.

HW / Used Oil Container Inspection Log

Date	Time	Inspector's Name	# of Containers	Container Condition	Observations	Date & description of discharges and cleanup

DO keep accurate inspection logs.

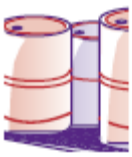
DO label all containers.

DON'T leave containers unlabeled.

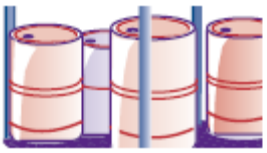
How should I manage hazardous wastes?

First, determine how much hazardous waste you generate **each month**. The rules you must follow depend on how much you generate, how much you store and how long you store it.

Less than 220 pounds per month (100 kilograms or about half a drum), and never accumulate more than 2,200 pounds (1,000 kg) at any time: you are a "Conditionally Exempt Small Quantity Generator" (CESQG).



220 -2,200 pounds per month (100-1,000 kilograms or about half a drum to 5 drums): you are a "Small Quantity Generator" (SQG).



More than 2,200 pounds per month (1,000 kilograms or more than about 5 drums): you are a "Large Quantity Generator" (LQG).

The following practices may be required for your business. Even if they are not required, they are good waste management practices. Additional information is available from FDEP.

Containers

- Maintain containers in good condition. Prevent leaks, ruptures and accumulation of rainwater on tops of drums.
- If a container leaks, transfer waste to a new container.
- Keep containers closed. Use self-closing funnels when adding waste. Do not allow wastes to evaporate; this is a serious offense.
- Wastes must be compatible with the container. For example, use HDPE plastic containers for corrosive wastes.
- Never place incompatible wastes, such as wastes that react with each other (e.g., acids and bases), in the same container.

Storage

- Maintain adequate aisle space between container rows to allow inspection for leaks and damages.
- Store ignitable and reactive wastes at least 50 feet from property boundaries.
- Store containers with incompatible wastes in separate areas.
- Time limit for SQGs is 180 days and 90 days for LQGs.

- For some hazardous material containers, secondary containment pallets or platforms may be a cost-effective option for spill-prevention.

Labels

HAZARDOUS WASTE
Federal Law Prohibits Improper Disposal
If found, please contact the nearest police, public safety authority or the US EPA
(Your business name, address and manifest document number)

- The above label represents proper wording for a hazardous waste label. You must also comply with Florida Department of Transportation requirements.
- Label every container with the type of waste and whether it is hazardous or non-hazardous.
- Include the accumulation start date (the date when waste was first placed in the container).
- Include your company name and address.
- Include federal waste code numbers.

Transport and Disposal

- Make sure your transport and disposal facilities have US EPA identification numbers.
- Use manifests for all hazardous wastes shipped off-site. Keep the manifests on-site.

Inspections and Recordkeeping

- Inspect containers at least once a week and keep a written log of container inspections.
- Keep a record of larger spills and use this information to identify the spill prevention options that might help your company.
- Keep training and inspection records for three years.
- Keep manifests and shipping receipts for three years.
- Keep records of lab tests for three years.
- Keep land disposal restriction forms for three years from the date the waste was last shipped.

How can I reduce hazardous wastes?

Reducing hazardous wastes in your photo shop makes good business sense. Benefits include:

- Saving money on waste management costs.
- Reducing concerns about penalties and liability.
- Creating a safer, healthier workplace.
- Promoting positive public relations with clients, customers and the local community.

How do I begin?

- Make a commitment to reducing wastes in every area of your business.
- Evaluate your shop's wastes and identify areas where changes can be made.
- Encourage the participation of all employees through education, training and incentives.

Processing

- Use silver recovery units or similar devices to reduce the volume and/or toxicity of waste processing chemicals and washes.
- Recycle reclaimed or recovered silver.
- Collect waste film for recycling with a waste film recycler.
- Replace hazardous chemicals with less hazardous or non-hazardous substitutes where possible.
- Return out-of-date or unused chemical products to the manufacturer.
- Install squeegees or air curtains between processing tanks to reduce carryover and help maintain low replenishment rates.
- Follow manufacturer recommendations for replenishment rates.
- Change filter cartridges in accordance with manufacturer guidelines.
- Use only low replenishment rate chemistry.

- Mix only what is needed.
- Be aware of "free samples" that may end up needing special and costly handling for disposal.
- Take advantage of recycling opportunities for plastic film containers, single use cameras and steel film magazines.

Solvents

- Reduce or eliminate solvent use by determining whether cleaning is really necessary.
- Use a multi-purpose solvent to reduce the types of hazardous waste that need to be managed.
- Find less hazardous substitutes for solvents, such as citrus-based, water-based or detergent-based cleaners.
- Replace solvent only when necessary.
- Use dedicated containers and equipment to minimize cross-contamination.

Training

- Train all personnel to identify, reduce and properly handle wastes.
- Train employees to use photographic chemicals and solvents efficiently, using minimal amounts to get the job done.
- Train new employees before they handle hazardous wastes.
- Training must cover hazardous waste management; OSHA and Right-to-Know training alone are not sufficient.
- Training must be documented. Some ways to document include the use of sign-in sheets and completion certificates.
- Make pollution prevention everyone's responsibility.

Shop Practices

- Minimize inventory and use a "first-in, first-out" system to prevent the need for disposal of old unused materials.
- Prevent leaks and spills. Keep floors clean.

Waste Reduction Checklist for Silver Recovery

Electrolytic Recovery

- ☐ Check the current on electrolytic units frequently (at least daily) to ensure it is within the range specified by the manufacturer.
- ☐ Check the units to ensure that agitation is adequate (the cathode or anode is rotating, the solution pumps are working).
- ☐ Use a filter to remove dirt and other particles from fixer solution before it enters the electrolytic unit.
- ☐ Use silver test strips daily on discharge water to make sure the units are operating efficiently.

Metallic Replacement or Chemical Replacement

- ☐ Use silver test strips daily on discharge water to make sure the units are operating efficiently.
- ☐ Change the canister immediately whenever the test strip shows silver in the discharge.
- ☐ Inspect the canister system often for plugging, channeling and leaks from the hose connection.
- ☐ Make sure the canister has a constant flow of solution running though it, rather than intermittent dripping during operation.

Silver and Waste Film Recyclers in Florida

Solely as a service to the public and Florida businesses, the Florida Department of Environmental Protection maintains a list of companies identified as providing reclamation, recovery and recycling services. The information is voluntarily supplied by the companies. A company's absence from the list does not imply prejudice or impropriety. The FDEP does not endorse specific equipment or companies.

The FDEP, by providing this list, does not imply that the companies are in compliance with applicable laws and regulations. Users of this list are responsible for assuring that products, equipment or services comply with the requirements of local, state and federal law. The FDEP cautions users to personally evaluate the services and compliance status of any company they use. The list is subject to change without notice. The FDEP welcomes information from companies who wish to have their products or services listed.

A more complete list of silver and waste film recyclers, including companies in other regions of the United States, can be obtained by calling FDEP at (850) 245-8723.

Action Metals & Refining
East-West Industrial Park Blvd. #3
West Highway 50
Clermont, FL 32711
Phone: (407) 877-2004

Chemical Pollution Control
3428 SW 15th Street
Deerfield Beach, FL 33442
Phone: (954) 480-9999

Intervent Recycling
4045 U.S. Highway 301 North
P.O. Box 2177
Dade City, FL 33526-2177
Phone: (800) 621-6102

Photographic Waste Control
1943 High Street
Longwood, FL 32750
Phone: (407) 328-9651

Tips from Inspectors

Drums

- You cannot have any mystery drums. All drums must be labeled and have a "birthdate" on them.
- Evaporation of hazardous waste is a serious violation. Do not allow the hazardous waste to evaporate. When you are not in the process of putting waste into the drum, you must keep it closed.
- You also are required to keep the top of the drum clean.
- Do not store old drums outside. If they get stormwater inside them, you will have to sample the stormwater and determine whether the water in the drum is hazardous. Insist that the person who sold you the drum and its contents takes the drum back when you are done with it.

- Inspectors go into dumpsters and walk the entire property line of a business. They go back into trees looking for orphan drums and distressed/dead vegetation.

Spills

- Clean up your spills at the time of the spill.

Transport

- The only generators who are allowed to transport their own waste are conditionally exempt small quantity generators. All other generators must use a hazardous waste hauler that has registered with the FDEP and the US EPA.

Waste

- The most common violation occurs with waste determination.
- Abandoned products are wastes.
- If you throw away containers, make sure the container is completely empty before you place it in a waste receptacle. Aerosol cans may be disposed of as hazardous waste in lab pack containers. You may also purchase a device which allows the cans to be punctured and drained safely. Empty cans may then be disposed of in the trash, while the contents may either be used or disposed of as waste.

Water

- If you discharge any waste that could be construed as a hazardous waste into a city sewer, you must have written permission of the city sewer system. The city sewer system must be a Publicly Owned Treatment Works (POTW). It cannot be a privately owned package plant.

- If you use rags, you should send the rags to a linen service that is served by a publicly-owned sewage treatment plant. If you use paper towels, you must make a determination as to whether the used paper towels are hazardous waste.
- Know where your drains go. All drains that lead from a hazardous materials area to a stormwater area should be sealed shut.

Who needs to know if my business generates hazardous waste?

Post Emergency Information

Post the following information near every telephone:

- Fire department phone number.
- Emergency coordinator's name and phone number.
- Locations of fire alarms and extinguishers.
- Locations of spill control materials.

Notify FDEP

If your company is a small or large quantity generator, notify FDEP to obtain a US EPA identification number. Local environmental agencies also should be notified.

Notify local authorities

Police and fire departments and local hospitals that would respond to an emergency need to know that hazardous wastes are on your property.

Designate an emergency coordinator

This person must know what to do in case of fire, spill or other emergency and must be on the premises or on call 24 hours a day.

Develop a contingency plan

Guidance on contingency plans is available from FDEP. Large quantity generators must have a written plan that includes:

- Emergency response arrangements with police and fire departments, hospitals and emergency response contractors.
- Emergency coordinator's address and phone number.
- On-site emergency equipment descriptions and locations.
- Evacuation plan and routes, including a site diagram.
- Spill reporting procedures.

Smaller generators (SQGs and CESQGs) should also have a contingency plan.

Checklist

This checklist will help you prevent the most common hazardous waste violations. For more detailed information on hazardous waste management requirements, contact FDEP.

- ☐ Each month, identify and record types and quantities of hazardous wastes.
- ☐ Notify FDEP and obtain a US EPA identification number.
- ☐ Use proper containers to collect and store wastes.
- ☐ Label all containers, whether product or waste, as to their contents.
- ☐ Include accumulation start dates on labels for each container.
- ☐ Keep all containers of hazardous waste or products containing regulated solvents closed at all times unless actively removing from or adding to them.
- ☐ Maintain aisle space between containers for inspection.
- ☐ Inspect containers weekly for rust, leaks or damage and keep a log.
- ☐ Never discharge hazardous wastes to a septic tank.
- ☐ Train employees to properly handle hazardous wastes.
- ☐ Designate an emergency coordinator.
- ☐ Notify police, hospitals and fire department.
- ☐ Post emergency information near each phone.
- ☐ Develop a contingency plan for emergencies.
- ☐ Use manifests for all waste transported for disposal.
- ☐ Keep all records for at least three years.

Where can I get more information?

Additional information on hazardous waste reduction and regulations is available from many sources.

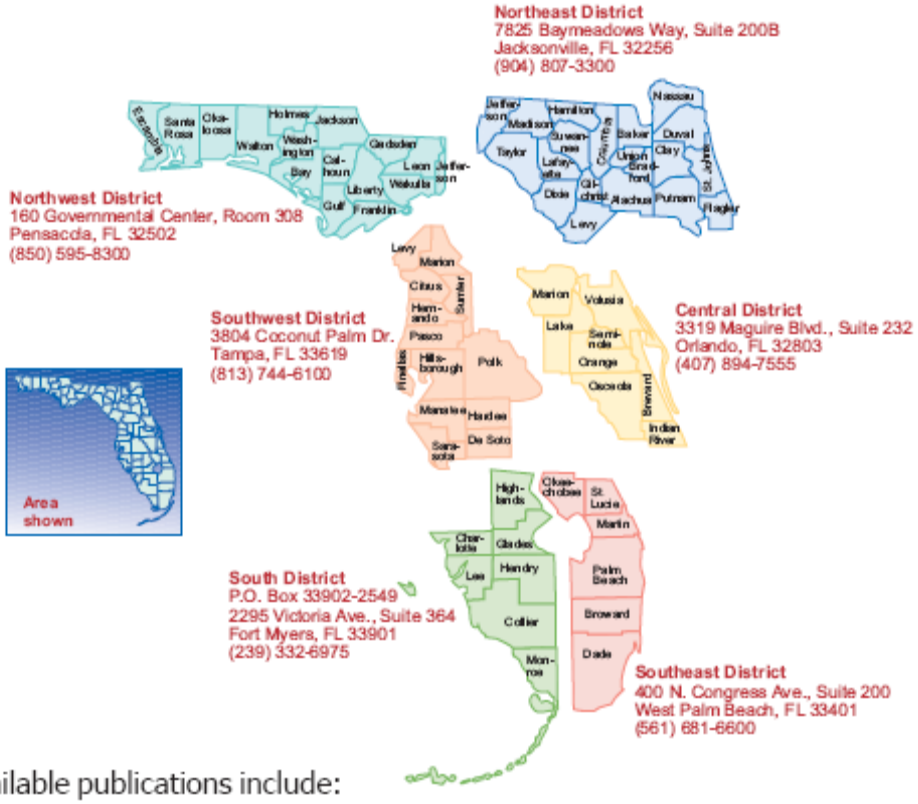
Florida Department of Environmental Protection

District offices and the Tallahassee office offer technical assistance, fact sheets and other publications on hazardous waste regulations.

DEP Information Line
Phone: (800) 741-4DEP
Fax: (850) 245-8810

Bureau of Solid and Hazardous Waste
Phone: (850) 245-8707

Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, FL 32399-2400
http://www.dep.state.fl.us/waste/



Available publications include:
Summary of Hazardous Waste Regulations
Requirements for Conditionally Exempt Small Quantity Generators
Requirements for Small Quantity Generators
Handbook for Small Quantity Generators of Hazardous Waste

U.S. Environmental Protection Agency

The US EPA has published a series of industry-specific guidelines and handbooks on preventing pollution and complying with hazardous waste regulations. RCRA Hotline: (800) 424-9346

Your Trade Associations

Many trade associations have published guides to help you find solutions to your hazardous waste management problems.

Florida Small Business Assistance Program

The Small Business Assistance Program helps businesses with environmental concerns and problems related to compliance with air regulations. Assistance is confidential and staff experts have business experience.

Phone: (800) 722-7457
http://www.dep.state.fl.us/air/programs/sbap.htm

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Appendix K **A GUIDE on HAZARDOUS WASTE MANAGEMENT for FLORIDA'S PHARMACIES**

A Guide on Hazardous Waste Management for Florida's Pharmacies

Hazardous Waste (RCRA) Compliance Assistance Program

With Support from:
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Thank you for the assistance and expertise you provided toward the preparation of this brochure. Your materials were extremely valuable and helped to produce an "easy to read" guidance brochure.

Florida Pharmacy Association and Capital Returns, Inc.

We would like to express our gratitude for your assistance and enthusiasm in the preparation of this brochure. We greatly appreciate the use of your materials as a guideline for the production of this brochure and for letting us use your best management practices within this publication.

Other RCRA publications produced by the Center for the Florida Department of Environmental Protection (DEP) include:

Guides on Hazardous Waste Management for Florida's
- Agricultural Pesticide Users
- Automotive Repair Shops
- Dry Cleaners
- Fiber-Reinforced Plastic Manufacturers
- Furniture Finishers
- Laboratories
- Paint and Body Shops
- Photo Shops
- Printed Wiring Board Manufacturers
- Printers

Managing Mercury: Best Management Practices for Florida's Medical Facilities

These publications are available from your County Environmental Protection Department, the DEP, or the Center. These publications can also be downloaded from the Center's web site.

Visit the Center's web site at http://www.floridacenter.org

This document was printed at a cost of $0.47 per copy on recycled paper. November 1999.

WHY SHOULD I CARE ABOUT HAZARDOUS WASTES?

Some of the materials produced in everyday pharmacy operations may be harmful to people or the environment.

This booklet suggests a five-step management plan with tips on how to:

- Comply with federal and state hazardous waste regulations.
- Avoid penalties by properly managing pharmaceuticals.
- Save money on disposal costs by reducing pharmaceutical wastes.

Health and the Environment

Hazardous pharmaceutical wastes disposed of improperly may contaminate soil or seep into the groundwater and contaminate drinking water supplies.

Hazardous pharmaceutical wastes disposed of improperly may run off into the nearest body of water where they may poison or kill fish and other wildlife.

Hazardous pharmaceutical wastes pose a health risk to you, your employees and your community.

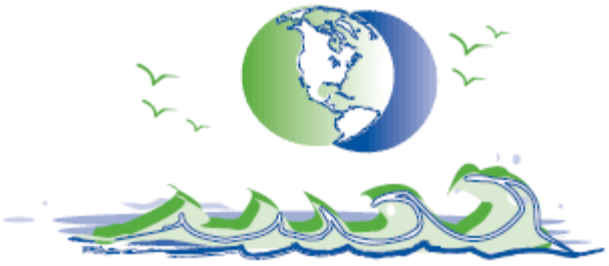
Cost Savings

State and county environmental compliance inspectors may visit your pharmacy to ensure that pharmaceutical wastes are being managed properly. State penalties may involve fines from $100 to $25,000 **per violation per day**.

Implementing an effective pharmaceutical waste control plan can reduce production and disposal costs and reduce your liability risk.

Public Image

Your customers will appreciate your efforts to prevent pollution. Your community will recognize your pharmacy as a good neighbor.



WHAT STEPS SHOULD I FOLLOW TO MANAGE MY PHARMACEUTICAL WASTES?

Some of the following practices may not be required for your pharmacy to remain in compliance with regulations. Even if they are not required, they are good waste management practices. Additional information is available from the Florida Department of Environmental Protection (DEP).

Step 1 ESTABLISH A PHARMACY MANAGEMENT PLAN

General Pharmaceutical Management

- Conduct random expired pharmaceutical audits and remove outdated products from inventory.
- Be sure to inspect all medication storage areas for outdated products.
- Remember that **pharmaceuticals include** the **samples** provided by pharmaceutical representatives or your suppliers.
- **Designate a clearly marked outdated pharmaceutical quarantine area to accumulate outdated pharmaceuticals or pharmaceutical products that cannot be sold.**
- All **pharmaceuticals discarded** by the facility **must be reviewed for hazardous waste status** and a determination must be made as to whether or not the discarded pharmaceuticals are hazardous waste.
- **Never discharge hazardous waste** to a drain that is connected to a publicly owned treatment works facility (POTW) without written permission from the POTW.
- **Never discharge hazardous waste** to a septic tank.
- **Never mix** hazardous pharmaceutical waste with biomedical waste for disposal.
- **Train all employees** according to your outdate management program and ensure that employees can identify, reduce and properly handle wastes.

General Pharmaceutical Management *(continued)*

- The Pharmacy has **two options** for managing outdated pharmaceuticals for credit through the return process:
  1. Use a **Reverse Distributor**, ***or***
  2. Process all returns and waste **Internally**.

Procedures for Managing Outdated Pharmaceuticals for Reverse Distribution

- Implement the **outdate management procedures** provided by your reverse distributor or create a written outdate management program and initiate it as standard operating procedure. *It is important to ensure that your reverse distributor is properly* ***permitted and insured.*** Check with the Florida Department of Health at (850) 487-1257 for a list of permitted reverse distributors in Florida. For a list of National Reverse Distributors, check with your Regional DEA Office or the Returns Industry Association (See page 20 for contact information).
- Your outdate management plan should include container, storage, labeling, shipping, and recordkeeping guidelines.

Procedures for Managing Outdated Pharmaceuticals Internally

- Separate and store outdated pharmaceuticals by manufacturer and by the manufacturer's return policy for possible return to the manufacturer.
- Using the manufacturer's return policy, distinguish between products eligible for credit and products that are not returnable for credit. Store and segregate these products according to the container and storage guidelines on page 10.
- Waste management procedures should include container, storage, labeling, shipping, and recordkeeping guidelines. Follow the hazardous waste and non-hazardous waste guidelines included in steps 2-5 of this brochure.

Step 1 ESTABLISH A PHARMACY MANAGEMENT PLAN *(continued)*

Management Scenarios:

- **Internal Management:** A pharmacy ***separates*** returnable from non-returnable pharmaceuticals and ***inventories*** all pharmaceuticals. The pharmacy ***ships*** only the returnable pharmaceuticals to a manufacturer, wholesaler or reverse distributor and retains the non-returnable pharmaceuticals for disposal. The **pharmacy** is the hazardous waste generator upon determining that the non-returnable pharmaceuticals are hazardous waste.
- **Reverse Distribution:** A pharmacy ***does not separate*** returnable from non-returnable pharmaceuticals, ***inventories*** all pharmaceuticals, and ***ships*** the pharmaceuticals as a product to a manufacturer or a reverse distributor. The **manufacturer** or **reverse distributor** is the hazardous waste generator upon determining that the non-returnable pharmaceuticals are hazardous waste.
- **Reverse Distribution:** A pharmacy ***contracts*** with a reverse distributor to work onsite. The reverse distributor does not separate returnable from non-returnable pharmaceuticals onsite, but inventories all pharmaceuticals, and ships the product to the reverse distribution facility. The ***reverse distribution facility*** is the hazardous waste generator upon determining that non-returnable pharmaceuticals are hazardous waste.

Rx Step 2

IDENTIFY YOUR HAZARDOUS AND NON-HAZARDOUS WASTES

WHEN ARE PHARMACEUTICALS CONSIDERED WASTE?

Be aware of the **Federal and State** interpretation.

- An outdated product is generally considered waste at the **time** and **place** the decision is made to discard it.
- According to the EPA, unsorted, outdated pharmaceuticals may be shipped as a product (rather than as a waste) if the outdated pharmaceuticals are being shipped to a reverse distributor or a manufacturer with the intent to return the outdated pharmaceuticals to the manufacturer for credit.

Waste pharmaceuticals include all pharmaceuticals that have been **identified as:**

- Outdated but **not returnable** for credit,
- Used in compounding or IV preparation,
- **Spilled** or **Broken Product** no longer useable for intended purpose, and
- Any items used in cleaning up a spill (vermiculite, paper towels, etc.) must be treated as a waste pharmaceutical, either hazardous or non-hazardous.

WHAT IS A HAZARDOUS WASTE?

A waste is defined as being HAZARDOUS if:

- It has any of the **characteristics** described on page 8.
- It is **listed** as a hazardous waste in the Code of Federal Regulations, 40 CFR Part 261.

Step 2 IDENTIFY YOUR HAZARDOUS AND NON-HAZARDOUS WASTES *(continued)*

Characteristic Wastes

A characteristic hazardous waste is a solid waste that exhibits any of the properties included in the definitions of ignitability, corrosivity, reactivity, and toxicity according to the Code of Federal Regulations, 40 CFR Part 261.

Listed Wastes

In addition to characteristic hazardous wastes, a waste is hazardous if it is identified as a **Listed Waste** in the Code of Federal Regulations, 40 CFR Part 261. There are numerous listed wastes, a partial list is provided on page 9. For details on listed wastes and waste code numbers, contact the DEP (See page 21 for DEP phone numbers). The Code of Federal Regulations is available online at http://www.access.gpo.gov/nara/cfr/, or you can obtain information by calling the U.S. Environmental Protection Agency's RCRA hotline at (800) 424-9346.

Acutely Hazardous Wastes

Acutely hazardous wastes are extremely dangerous wastes. Small amounts of these wastes, such as arsenic and cyanide compounds, are regulated in the same way as large amounts of other wastes. A pharmacy that generates 2.2 pounds (1 kilogram) or more of these acutely toxic wastes per month is subject to full regulation under the hazardous waste rules. Contact the DEP for more information on the proper management of acutely Hazardous Wastes.

Identifying Your Hazardous Wastes

Once it has been determined that an outdated pharmaceutical cannot be returned to the manufacturer, that pharmaceutical is classified as a waste. If this determination has been made at the pharmacy, it is very important to determine whether the waste is hazardous or non-hazardous. There are several ways to identify hazardous wastes.

Identifying Your Hazardous Wastes *(continued)*

- Obtain and read Material Safety Data Sheets (MSDS).
- Talk to product suppliers and manufacturers.
- Read product labels.
- Compare product to hazardous waste characteristics and to wastes listed in federal regulations.
- If product information is not available or is inconclusive, have a commercial lab sample and test the waste using the Toxicity Characteristic Leaching Procedure (TCLP).
- A non-hazardous material or product may become a hazardous waste due to contaminants added during use. Lab testing may be necessary to determine whether or not the waste is hazardous. This is called a "waste determination."

Additional Resources for Identifying Hazardous Wastes

American Hospital Formulary Service (AHFS Drug Information)
Remington's Pharmaceutical Sciences
Merck Manual
The Pill Book – OTC Medications
The Pill Book – Most Prescribed Drugs
Red Book – Pharmacy Fundamental Reference
CRC Handbook of Chemistry and Physics
Drug Facts and Comparisons

Information on the Internet

http://www.RX@RXLIST.COM

CHARACTERISTIC WASTES

Ignitable (A majority of the hazardous wastes that pharmacies handle are hazardous because they are ignitable. These wastes often pose the greatest management problems for pharmacies.)

Ignitable wastes are easily combustible or flammable. If they have a flashpoint of 140° F or less or an alcohol content of 24% or more, they are hazardous wastes. Examples include: alcohol (denatured ethyl, ethyl, isopropyl alcohol, and etc.), ammonia inhalants, amyl nitrite, Anbesol®, AquaNet® aerosol spray, benoxyl peroxide, Benzoin Tincture, Collodion Based Preparations, Bronchial Dilators (Tornalate), Compound W®, Cleocin T Topical Solution®, Erythromycin Topical Solution, Merthiolate Tincture, mouthwash (alcohol content >24%), Peppermint Spirit, Retin A Gel®, Right Guard® aerosol spray, Silver Nitrate (oxidizer), Solarcaine® aerosol spray, and some cough medicines (Nyquil®).

Corrosive

Corrosive wastes corrode metals or other materials or burn the skin. These liquids have a pH of 2 or lower or 12.5 or higher. Examples of acids that exhibit a pH of 2 or lower include glacial acetic acid and Liquid Phenol (Carbolic Acid). Examples of bases that exhibit a pH of 12.5 or higher include Potassium Hydroxide and Sodium Hydroxide.

Reactive

Reactive wastes are unstable and may explode or react rapidly or violently with water or other materials. Examples include Clinatest (a test tablet to determine sugar in urine) and some nitroglycerin formulations.

Toxic

Wastes are toxic if they contain toxic organic chemicals or certain heavy metals, such as chromium, lead, mercury, or cadmium. Examples of potential toxic pharmaceuticals include: Arsenic, Barium, Barium Enemas, Cadmium, Chloroform, Chromium, Fluogen, Fluzone, Insulin with Cresol, Lindane, Merbromin, Mercury, Mercurochrome, Mixture of Trace Elements, Selenium, Silver, Silver Nitrate, Thimerosal (contains Mercury), and vaccines containing mercury as a preservative. Approximately 40 chemicals meet specific leaching concentrations which classify them as toxic.

LISTED WASTES

There are two types of listed pharmaceutical hazardous wastes. These are known as acutely hazardous **(P-listed)** and toxic **(U-listed)**.

P-listed Pharmaceutical Wastes – These wastes are known as **acutely hazardous.**

NAME	HW#
Epinephrine (Adrenaline)	P042
Nicotine	P075
Nitroglycerine	P081
Physostigmine	P204
Physostigmine salicylate	P188
Sodium Azide	P105
Strychnine	P108
Warfarin >.3%	P001

U-listed Pharmaceutical Wastes – These wastes are known as **toxic**.

NAME	HW#
Acetone	U002
Chlorambucil	U035
Chloroform	U044
Cyclophosphamide	U058
Daunomycin	U059
Dichlorodifluromethane	U075
Diethylstilbestrol	U089
Formaldehyde	U122
Hexachlorophene	U132
Lindane	U129
Melphalan	U150
Mercury	U151
Mitomycin C	U010
Paraldehyde	U182
Phenacetin	U187
Phenol	U188
Reserpine	U200
Resorcinol	U201
Saccharin	U202
Selenium sulfide	U205
Streptozotocin	U206
Trichloromonofluromethane	U121
Uracil mustard	U237
Warfarin <.3%, (Coumadin)	U248

NOTE: These are not comprehensive lists of "P" and "U" listed chemicals. For a complete list, refer to: 40CFR§261.33. The Code of Federal Regulations is available online at http://www.access.gpo.gov/nara/cfr/, or you can obtain information by calling the U.S. Environmental Protection Agency's RCRA hotline at (800) 424-9346.

Step 3

IMPLEMENT BEST MANAGEMENT PRACTICES (BMPS) FOR:

Container Maintenance

- Maintain containers in good condition.
- Never place incompatible wastes, such as wastes that react with each other, in the same container. (e.g. Do not store acids and bases in the same container.)
- Wastes must be compatible with the container that they are being stored in (plastic or metal). (e.g. Do not store strong acids or bases in metal containers.)

Storage

- Separate waste by hazardous waste classification: P- or U-Listed, Toxicity, Ignitability, Corrosivity, and Reactivity.
- Don't combine hazardous waste with non-hazardous waste.
- Maintain aisle space between containers to allow for inspection.
- Inspect medication storage area.
- Be aware of allowable time limits for storage.

Labels

- Label every container with the contents (**type of pharmaceutical or waste**).
- Label every container with whether it is a **hazardous waste** or a **non-hazardous waste**.
- Include any **federal waste code numbers** that apply.
- Include the **accumulation start date** (the date when waste pharmaceuticals were first stored in the container).
- Include your pharmacy **name** and **address**.
- Use the following words on labels for **hazardous** wastes:

> HAZARDOUS WASTE
> FEDERAL LAW PROHIBITS IMPROPER DISPOSAL
>
> If found, please contact the nearest police or public safety authority or the U.S. EPA
>
> (Your business's name, address and manifest document number)

- Use the following words on labels for **non-hazardous** wastes:

> **NON-REGULATED WASTE**
>
> Optional Information _____
> Shipper _____
> Address _____
> City, State, Zip _____
> Proper DOT Shipping Name _____
> U.N. or N.A. No _____
> Contents _____
>
> THIS WASTE IS NOT REGULATED BY THE U.S. EPA

Step 3

IMPLEMENT BEST MANAGEMENT PRACTICES (BMPS) FOR: *(continued)*

Recordkeeping

- Inspect containers at least once a week and keep a written log of container inspections.
- Total weight of P-listed waste generated monthly must be documented on a monthly basis (Weight of the Container/ Solvent Included).
- Total weights of U-listed and characteristic waste generated monthly must be documented on a monthly basis.
- Keep training and inspection records for 3 years.
- Keep manifests and shipping receipts for 3 years.
- Keep records of completed inventories/audits regarding the distribution or shipment of prescription drugs for 2 years.
- Keep records of lab tests for 3 years.
- Keep completed land disposal restriction forms for 3 years.

Spills

- **Keep** spill cleanup materials readily accessible including: fire extinguishers; safety equipment such as rubber or latex gloves and safety glasses; spill cleanup products such as absorbents, rags, towels, brooms, shovels and dust pans to pick up materials; and containers to hold spill waste.
- **Observe** the safety precautions associated with the material spilled.
- **Stop** the source of the spill immediately and **cleanup** the spill right away.
- **Recover** the spilled substance while observing safety precautions.
- **Contain** the spilled material.
- **Call** your local fire and/or police departments if fire or public safety hazards are created.

Step 4

DETERMINE YOUR WASTE GENERATOR STATUS

You must determine how much hazardous waste you generate each month. The set of rules you must follow depends on how much waste you generate, how much you store, and how long you store it.

- If you generate **less than 220 pounds** of hazardous waste (100 kilograms or about half a drum) per month or you generate less than 1 kilogram of an acute hazardous waste per month: you are a **"Conditionally Exempt Small Quantity Generator."**
- If you generate **220 - 2,200 pounds** of hazardous waste (100 – 1,000 kilograms or about half a drum to 5 drums) per month: you are a **"Small Quantity Generator."**
- If you generate **more than 2,200 pounds** of hazardous waste (1000 kilograms or more than about 5 drums) per month or you generate 1 kilogram or more of an acute hazardous waste per month: you are a **"Large Quantity Generator."**

Step 5

COMPLY WITH GUIDELINES FOR TRANSPORT AND DISPOSAL

TRANSPORT GUIDELINES FOR MANAGING OUTDATED PHARMACEUTICALS INTERNALLY

Shipping Guidelines for Waste Transport & Disposal

- Conduct a complete inventory/audit of all pharmaceuticals or wastes being shipped offsite. Keep records of completed inventories/audits for 2 years.
- Make sure your transporter is properly permitted and has an EPA identification number.
- Make sure that the treatment, storage and disposal facility receiving your shipment has an EPA identification number and is properly permitted to dispose of the waste you are shipping.
- Use manifests for all hazardous wastes shipped offsite.
- Follow container, storage and label guidelines described on pages 10-11.

Federal Drug Enforcement Administration (DEA) Regulations

- If you are shipping Controlled Substances for disposal/destruction, be sure to follow DEA Regulations. For more information on shipping controlled substances for disposal/destruction, contact your Regional DEA office (see page 20).
- If any of your controlled substances are hazardous waste and are destined for disposal/destruction, contact the DEP (see page 21).

TRANSPORT GUIDELINES FOR MANAGING OUTDATED PHARMACEUTICALS FOR REVERSE DISTRIBUTION

Shipping Guidelines for Waste Transport & Disposal

- Wrap glass/vials/ampules carefully.
- Segregate Controlled Substances in tamper-proof pouches with no external indication of what is being shipped.
- Apply DOT Hazardous Materials Label:
  - ORM-D Consumer Commodity, ***and***
  - Up arrows if over 1 liter.

Federal Drug Enforcement Administration (DEA) Regulations

(For contact information see page 20.)

- If you are shipping Controlled Substances, be sure that all DEA regulations are followed.
- Be sure your reverse distributor is registered to accept the products being shipped. The DEA requires that all transfers be made between registrants.
- Inventory all Controlled Substances in Schedules III - V:
  - Include one copy in the shipment.
  - Retain one copy for your records at the pharmacy.
- If you are shipping Schedule II products, the reverse distributor must provide you with a Form 222 for the products being shipped prior to the shipment. Follow the procedures of your reverse distributor.
- DO NOT indicate that the contents of the shipment contain controlled substances.
- DO NOT request or accept a Form 41.

Summary

HOW CAN I REDUCE PHARMACEUTICAL WASTE GENERATION?

Make a **commitment to reducing waste** in every area of your pharmacy's operations.

Evaluate your pharmacy's waste and identify areas where changes can be made.

Facilitate and encourage the participation of all pharmacy personnel through **education, training,** and **incentives.**

Apply Inventory Management Techniques.

- Dispense older pharmaceuticals first.
- Create an effective inventory system to reduce outdate accumulation.
- After inventory is reduced, prevent the accumulation of new inventory.
- Save money by ordering smaller quantities of pharmaceuticals and reducing the need to dispose of outdated pharmaceuticals.
- Purchase pharmaceuticals from suppliers who will accept returns of unopened pharmaceuticals.
- Purchase pharmaceuticals from vendors who promote small quantity purchases and who will accept returns of unopened bottles.
- If a constant stock is required, perform an inventory review at least once a year to evaluate ordering trends and pharmacy inventory needs.

Reverse Distribution

- If you inventory and ship all unsorted outdated pharmaceuticals as products to a qualified and properly permitted reverse distributor; ***OR***
- If you contract a reverse distributor to inventory and ship all unsorted, outdated pharmaceuticals as products to the reverse distribution facility; ***THEN***
- The reverse distribution facility becomes the Hazardous Waste Generator upon determining that the non-returnable pharmaceuticals are hazardous waste.
- Your reverse distributor should:
  - Inventory and review all items for return eligibility at the reverse distribution facility, and
  - Properly manage all non-returnable items as either hazardous or non-hazardous waste.
- **It is your RESPONSIBILITY to ensure that the reverse distributor is properly handling your outdated pharmaceuticals.**

WHAT ARE THE END RESULTS?

These steps will help to ensure that your pharmacy is able to effectively:

Develop a consistent outdate reduction and management program,

Develop and implement a waste reduction program,

Understand and apply RCRA and State environmental regulations, and

Assure compliance in all departments to successfully avoid regulatory fines.

Reducing wastes in your pharmacy **makes sense.** Benefits include:

Maximizing **profits,**

Saving money on waste management costs,

Earning a greater return on investments,

Reducing concerns about penalties and liability,

Creating a safer and healthier workplace, ***and***

Promoting positive public relations with clients, customers and the local community.

CHECKLIST

This checklist will help you to prevent the most common hazardous waste violations. For more detailed information on hazardous waste management requirements, contact the DEP.

- ◯ Identify types and quantities of hazardous wastes.
- ◯ Notify the Florida DEP of your monthly hazardous waste generation, and obtain an EPA identification number from the DEP.
- ◯ Use proper containers to collect and store wastes.
- ◯ Separate waste by classification: Toxicity, Ignitibility, Corrosivity, and Reactivity.
- ◯ Don't combine hazardous waste with non-hazardous waste.
- ◯ Label all containers as hazardous or non-hazardous waste.
- ◯ Include the accumulation start dates on labels.
- ◯ Maintain aisle space between containers for inspection.
- ◯ Inspect containers weekly for rust, leaks or damage and keep inspection records for three years.
- ◯ Total weight of P-Listed waste must be documented monthly.
- ◯ Total weights of U-Listed and characteristic waste must be documented monthly.
- ◯ Never discharge hazardous wastes to a drain or a septic tank unless you have an DEP permit that allows you to do so.
- ◯ Train employees to properly handle hazardous wastes.
- ◯ Make sure your transporter and disposal facility have EPA identification numbers.
- ◯ Make sure your reverse distributor is properly licensed and registered.
- ◯ Use Manifests for all waste transported for disposal.
- ◯ Keep all records for at least three years.

WHERE CAN I GET MORE INFORMATION?

Additional information on hazardous waste reduction and regulations is available from many sources.

Florida Department of Environmental Protection

District offices and the Tallahassee office offer technical assistance, fact sheets and other publications on hazardous waste regulations.

Web site: http://www.dep.state.fl.us/

Hazardous Waste Compliance Assistance Program

Phone: (800) 741-4337
(850) 488-0300
Fax: (850) 921-8018

Publications available:

Summary of Hazardous Waste Regulations
Requirements for Conditionally Exempt Small Quantity Generators
Requirements for Small Quantity Generators
Handbook for Small Quantity Generators of Hazardous Waste

Florida Board of Pharmacy

Web site: http://www.doh.state.fl.us/mqa/pharmacy/pshome.htm

Address: Board of Pharmacy
2020 Capital Circle SE, Bin #C04
Tallahassee, FL 32399-3254

Phone: (850) 414-2969

Email: bobbie_sawner@doh.state.fl.us

Florida Small Business Assistance Program

The Small Business Assistance Program helps businesses with environmental concerns. Assistance is confidential and staff experts have business experience.

Phone: (800) 722-7457

U.S. Environmental Protection Agency

The EPA has published a series of industry-specific guidelines and handbooks on preventing pollution and complying with hazardous waste regulations. The RCRA Hotline will provide answers to your hazardous waste management questions. Calls and questions will be kept anonymous at your request.

RCRA Hotline
Phone: (800) 424-9346

DEA CONTACTS IN FLORIDA

MIAMI DIVISION
8400 Northwest 53rd Street
Miami, Florida 33166
(305) 590-4870

ORLANDO DIVISION
300 International Parkway, Suite 424
Heathrow, Florida 32746
(407) 333-7046

TAMPA DIVISION
4950 West Kennedy Boulevard, Suite 400
Tampa, Florida 33609
(813) 288-1290

YOUR TRADE & PROFESSIONAL ASSOCIATIONS

Many trade and professional associations have published guides to help you find solutions to your hazardous waste management problems.

AMERICAN PHARMACEUTICAL ASSOCIATION
2215 Constitution Avenue,
Northwest
Washington, DC 20037-2985
(202) 628-4410

AMERICAN ACADEMY OF PHARMACEUTICAL PHYSICIANS
1135 Kildare Farm Road
Suite 200-8
Cary, North Carolina 25711
(919) 469-9906

AMERICAN ASSOCIATION OF PHARMACEUTICAL SCIENTISTS
1650 King Street, Suite 200
Alexandria, Virginia 22314-2747
(703) 548-3000

FLORIDA PHARMACY ASSOCIATION
610, North Adams Street
Tallahassee, Florida 32301
(850) 222-2400

RETURNS INDUSTRY ASSOCIATION
8000 Towers Crescent Drive
Suite 1350
Vienna, VA 22182
(703) 847-3696
Email: riawash@aol.com

OFFICES OF THE FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION

Hazardous Waste Regulation Section

Twin Towers Office Building • 2600 Blair Stone Road
Tallahassee, FL 32399-2400
(850) 488-0300

Northwest District
160 Government Center
Pensacola, FL 32501
(850) 695-8360

Northeast District
7825 Baymeadows Way, Suite 200B
Jacksonville, FL 32256
(904) 448-4300

Southwest District
3804 Coconut Palm Dr.
Tampa, FL 33619
(813) 744-6100

Central District
3319 Maguire Blvd.
Orlando, FL 32803
(407) 894-7555

South District
2295 Victoria Ave., Suite 364
Fort Myers, FL 33901
(941) 332-6975

Southeast District
400 N. Congress Ave.
West Palm Beach, FL 33401
(561) 681-6600

The Florida Department of Environmental Protection is an equal opportunity agency and does not discriminate on the basis of race, creed, color, disability, age, religion, national origin, sex, marital status, disabled veteran's status, Vietnam Era veteran's status or sexual orientation.

University of Florida
Florida Center for Solid and
Hazardous Waste Management
2207-D NW 13th Street
Gainesville, FL 32609
Phone: (352) 392-6264
Fax: (352) 846-0183
Email: floridacenter@floridacenter.org

Non-Profit
Organization
U.S. POSTAGE
P A I D
Gainesville, FL
Permit No. 94

For additional information contact:
Janet Ashwood
Florida Department of Environmental Protection
Hazardous Waste Compliance Assistance Program
2600 Blair Stone Road, MS #4560
Tallahassee, FL 32399-2400
Phone: (850) 488-0300
Fax: (850) 921-8018

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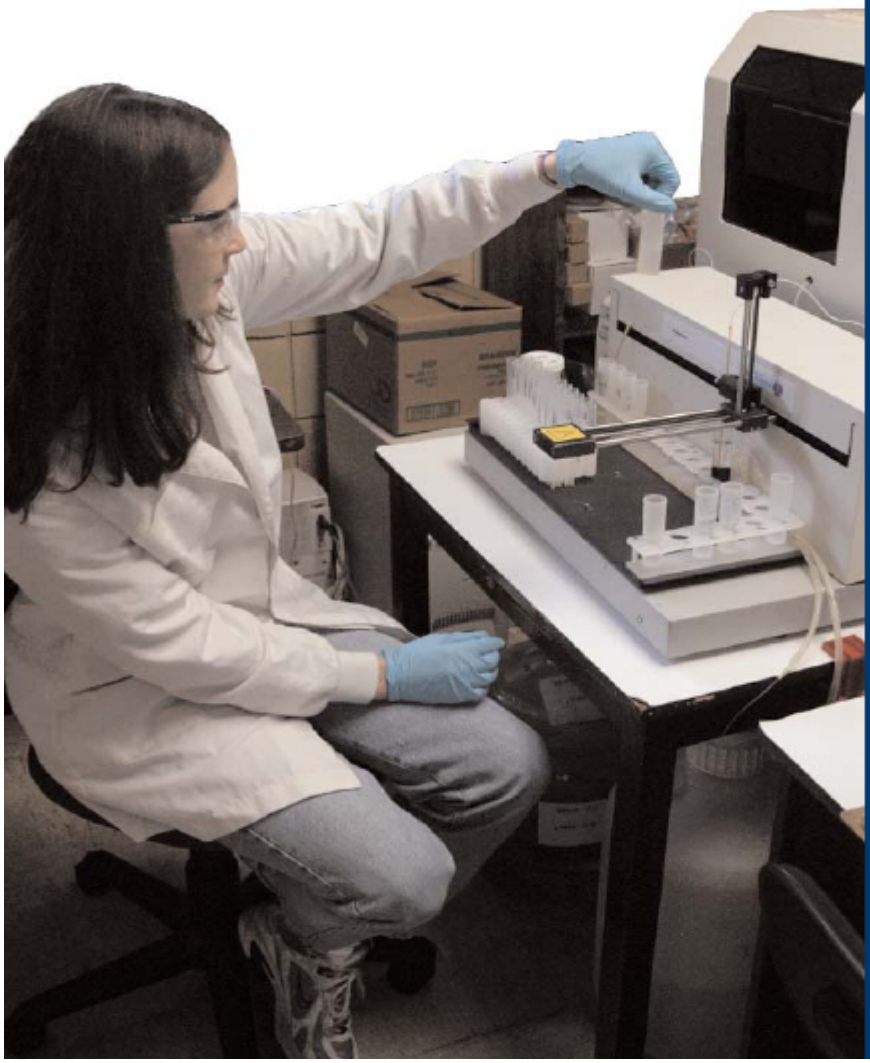
Appendix L **A GUIDE on HAZARDOUS WASTE MANAGEMENT for FLORIDA'S LABORATORIES**

A Guide on Hazardous Waste Management for Florida's Laboratories



Florida Department of Environmental Protection Hazardous Waste Compliance Assistance Program

This document was published to help educate businesses on hazardous waste management issues affecting them. The suggested options may help businesses to operate in an environmentally appropriate manner. Some of the options may go beyond what is required to remain in compliance with regulations. Business owners are responsible for obtaining complete information about applicable regulations. Misrepresentations or omissions by the Florida Department of Environmental Protection or the Florida Center for Solid and Hazardous Waste Management do not relieve any person from any requirement of federal regulations or Florida law.

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These regulations are available at many public libraries. In addition, the Florida Department of Environmental Protection and the United States Environmental Protection Agency have posted links to copies of these regulations on the agencies' Internet sites:

http://www.dep.state.fl.us
http://www.epa.gov

These sites also provide access to agency forms, fact sheets, checklists, rule summaries, answers to frequently asked questions and reports from our public information databases. Individuals who do not have Internet access may obtain copies of department publications through the contact information listed on page 17 of this document.

Revised June 2003

Why should I care about hazardous wastes?

As a business owner, operator or employee, you may be producing materials that can harm people and the environment. This booklet offers helpful tips on how to:

- Comply with federal and state hazardous waste regulations.
- Avoid penalties by properly managing hazardous wastes.
- Save money on disposal costs by reducing hazardous wastes.

Health and Environment

Hazardous wastes spilled or dumped on the ground or disposed in dumpsters may seep into the groundwater and contaminate drinking water supplies.

Hazardous wastes may run off into the nearest body of water where they may poison or kill fish and other wildlife.

Hazardous wastes pose a risk to you, your employees and your community.

Cost Savings

State and county inspectors may visit your business to ensure that hazardous wastes are being managed properly. State penalties range from $100 to $50,000 **per violation per day**.

Reducing hazardous wastes can reduce your production and disposal costs and reduce your risk of future liability.

Public Image

Your customers will appreciate your efforts to prevent pollution.

Your community will recognize your business as a good neighbor.

What is a hazardous waste?

A waste is hazardous if:

- It is listed as a hazardous waste in the Title 40 Code of Federal Regulations (CFR) Part 261, Subpart D.
- It has any of the characteristics described below:

Characteristic Wastes

Ignitable

Ignitable wastes are flammable or spontaneously combustible. If they have a flashpoint of less than 140 degrees Fahrenheit or an alcohol content of 24% or more, they are hazardous wastes. Examples include some alcohols and chromates (oxidizers).

Corrosive

Corrosive wastes can burn the skin or corrode metals. Liquids with a pH of 2 or lower or 12.5 or higher are corrosive. Examples include strong acids and bases.

Reactive

Reactive wastes are unstable and may explode or react rapidly or violently with water or other materials. Examples include sulfides, cyanides and crystallized (dry) picric acid.

Toxic

Wastes are toxic if they contain certain heavy metals above specific concentrations, such as chromium, lead, mercury or cadmium, or toxic organic chemicals. Examples include benzene, trichloro-ethylene and tetrachloroethylene.

Listed Wastes

Some industrial processes and chemical wastes are listed specifically as hazardous in the federal regulations under 40 CFR 261, Subpart D. Copies of the rule can be found at many public libraries, on the internet (http://www.access.gpo.gov/nara/cfr/) or may be purchased from the Government Printing Office.

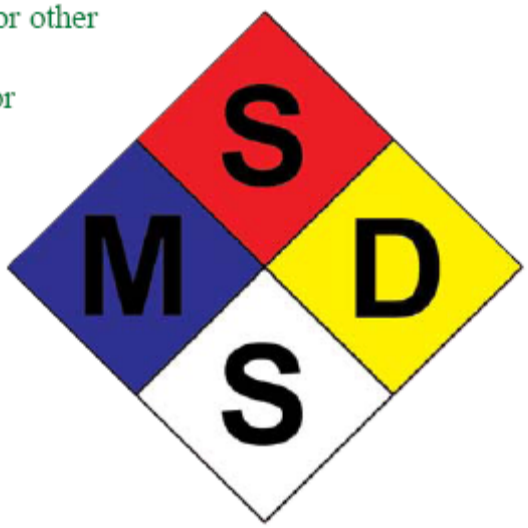
Acutely Hazardous Wastes

Small amounts of very dangerous wastes, such as arsenic and cyanide compounds, are regulated in the same way as large amounts of other wastes. A business that generates 2.2 pounds (1 kilogram) or more of these acutely hazardous wastes per month is subject to full regulation under the hazardous waste rules.

Identifying Your Hazardous Wastes

It is very important to determine whether a waste is hazardous or non-hazardous. There are several ways to identify hazardous wastes.

- Always ask for a Material Safety Data Sheet (MSDS) before ordering any new product. The MSDS will give you valuable information about the product. Note: the MSDS does not identify chemicals present in concentrations less than 1%, or 10,000 parts per million.
- Talk to product suppliers and manufacturers.
- Read product labels.
- Compare product and process information to hazardous waste characteristics and to wastes listed in federal regulations.
- If product or process information is not available or is inconclusive, have a commercial lab sample and test the waste using the TCLP test or other appropriate analytical tests.
- A non-hazardous material or product may become a hazardous waste due to contaminants added during use. Lab testing may be necessary.



Sources of Hazardous Waste

- **Spent solvents** used in cleaning, extraction and other processes.
- **Non-empty** solvent containers or aerosol cans.
- **Testing samples,** if they are not entirely consumed by the test procedure.
- **Unused reagents** that are no longer needed, do not meet specifications, are contaminated, have exceeded their storage life or are otherwise unusable in the lab.
- **Reaction products** of known or unknown composition. Try to identify reaction products and label them for proper disposal.
- **Absorbents** used to clean up hazardous wastes.
- **Contaminated materials** such as glassware, gloves, paper and plastic products.
- **Used chromatography vials.**
- **Gas cylinders.**
- **Mercury spills.**

Typical Hazardous Wastes

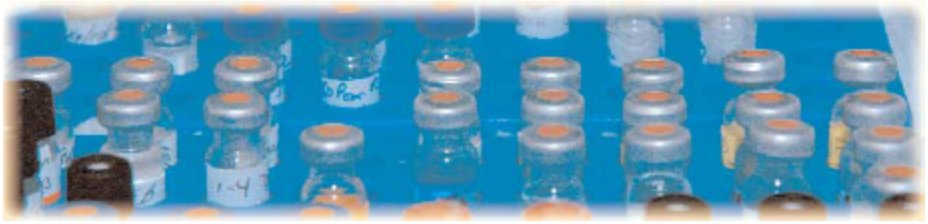
ACIDS/BASES (corrosive)
- Acetic acid
- Ammonium hydroxide
- Hydrochloric acid (muriatic acid)
- Nitric acid
- Oleum
- Potassium hydroxide
- Sodium hydroxide
- Sulfuric acid

REACTIVES
- Calcium metal
- Dry picric acid (should not be disposed of by untrained personnel)
- Potassium cyanide
- Potassium metal
- Sodium hydride
- Sodium sulfide
- Stannic chloride

OXIDIZERS (ignitable)
- Ammonium chromate
- Chromium trioxide
- Lead chromate
- Manganese dioxide
- Potassium permanganate
- Silver nitrate
- Sodium bromate
- Sodium chromate

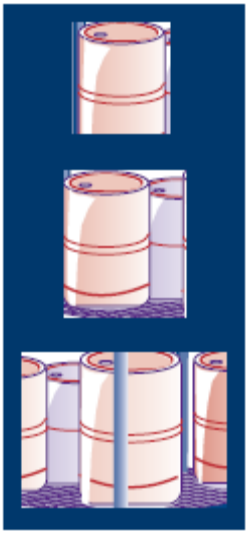
SOLVENTS (ignitable)
- Acetone
- Benzene
- Ethanol
- Ethyl ether
- Formaldehyde (potential)
- Hexane
- Isopropanol
- Methanol
- Methylene chlorides
- Methyl ethyl ketone (MEK)
- Pentane
- Pyridine
- Tetrahydrofuran
- Toluene
- Xylene

TOXICS
- Acetaldehyde
- Allyl alcohol
- Barium
- Carbon disulfide
- Carbon tetrachloride
- Chloroform
- Chromium
- Hydrazine
- Lead
- Mercury
- Naphthalene
- Sodium azide



How should I manage hazardous wastes?

First, determine how much hazardous waste you generate **each month**. The rules you must follow depend on how much you generate, how much you store and how long you store it.



Less than 220 pounds (100 kilograms or about half a drum): you are a "Conditionally Exempt Small Quantity Generator" (CESQG).

220 - 2,200 pounds (100-1,000 kilograms or about half a drum to 5 drums): you are a "Small Quantity Generator" (SQG).

More than 2,200 pounds (1,000 kilograms or more than about 5 drums): you are a "Large Quantity Generator" (LQG).

The following practices may be required for your business. Even if they are not required, they are good waste management practices. Additional information is available from FDEP.

Containers

- Maintain containers in good condition. Prevent leaks, ruptures and accumulation of rainwater on tops of drums.
- If a container leaks, transfer waste to a new container.
- Keep containers closed. Use self-closing funnels when adding waste. Do not allow wastes to evaporate; this is a serious offense.
- Wastes must be compatible with the container. For example, use HDPE plastic containers for corrosive wastes.
- Never place incompatible wastes, such as wastes that react with each other (e.g., acids and bases), in the same container.

Storage

- Maintain adequate aisle space between container rows to allow inspection for leaks and damages.
- Store ignitable and reactive wastes at least 50 feet from property boundaries.
- Store containers with incompatible wastes in separate areas.
- Time limit for SQGs is 180 days and 90 days for LQGs.

Labels

HAZARDOUS WASTE
Federal Law Prohibits Improper Disposal
If found, please contact the nearest police, public safety authority or the US EPA

(Your business name, address and manifest document number)

- The above label represents proper wording for a hazardous waste label. You must also comply with FDOT.
- Label every container with the type of waste and whether it is hazardous or non-hazardous.
- Include the accumulation start date (the date when waste was first placed in the container).
- Include your laboratory name and address.
- Include federal waste code numbers.

Transport and Disposal

- Make sure your transport and disposal facility have US EPA identification numbers.
- Use manifests for all hazardous wastes shipped off-site. Keep the manifests on-site.

Inspections and Recordkeeping

- Inspect containers at least once a week and keep a written log of container inspections.
- Keep a record of larger spills and use this information to identify the spill prevention options that might help your lab.
- Keep training and inspection records for three years.
- Keep manifests and shipping receipts for three years.
- Keep records of lab tests for three years.
- Keep land disposal restriction forms for three years from the date the waste was last shipped.

Training

- Train all personnel to identify, reduce and properly handle wastes.
- Train new employees before they handle hazardous wastes.
- Inform employees of the importance of pollution prevention.

How can I reduce hazardous wastes?

Reducing hazardous wastes makes good business sense. Benefits include:

- Saving money on waste management costs.
- Reducing concerns about penalties and liability.
- Creating a safer, healthier workplace.
- Promoting positive public relations with clients, customers and the local community.

How do I begin?

- Make a commitment to reducing wastes in every area of your laboratory's operations.
- Evaluate your laboratory's wastes and identify areas where changes can be made.
- Encourage the participation of all laboratory personnel through education, training and incentives.

Purchasing

- Save money by ordering smaller quantities of chemicals and reducing the need to dispose of excess chemicals.
- Purchase smaller packages of chemicals to reduce storage requirements and reduce the risk of breakage and accidents.
- Purchase gas cylinders from vendors who will take back the empty cylinders.
- Purchase chemicals from suppliers who will take back unopened chemicals.
- Purchase supplies from vendors who promote small quantity purchases and who will accept returns of unopened bottles.

Inventory

- Use older chemicals first.
- Use the chemicals in the stockroom first before ordering new products.
- Label all chemicals with date of manufacture.
- Create an effective inventory system to reduce waste.
- After inventory is reduced, prevent accumulation of new inventory.
- If a constant stock is required, perform an inventory review at least once a year.

Laboratory

- Do microscale experiments using smaller vessels and smaller amounts of chemicals.
- Do one-pot reactions where one reaction's product(s) can be the starting point for another reaction.
- Use water-based solvents.
- Perform in-lab treatment of waste including neutralization, separation, fixation, oxidation, precipitation, degradation or ion exchange.
- Reuse acid mixtures for electroplating.

Cleanup

- Use detergents and hot water instead of chromic acid solutions to clean.
- Recover noble metals such as silver and palladium and heavy metals such as mercury.
- If possible, convert waste to product for another reaction.
- Train all personnel to use smaller amounts of chemicals and to properly dispose of waste.

Dos and Don'ts

DO
Keep containers closed

DON'T
Leave containers open

DO
Keep accurate inspection logs

DO
Label all containers

DON'T
Leave containers unlabeled

Who needs to know if my laboratory generates hazardous waste?

Post Emergency Information

Post the following information near every telephone:

* Fire department phone number.
* Emergency coordinator's name and phone number.
* Locations of fire alarms and extinguishers.
* Locations of spill control materials.

Notify FDEP

If your laboratory is a small or large quantity generator, notify FDEP to obtain a US EPA identification number. Local environmental agencies also should be notified.

Notify local authorities

Police and fire departments and local hospitals that would respond to an emergency need to know that there are hazardous wastes on your property.

Designate an emergency coordinator

This person must know what to do in case of fire, spill or other emergency and must be on the premises or on call 24 hours a day.

Develop a contingency plan

Guidance on contingency plans is available from FDEP. Large quantity generators must have a written plan that includes:

* Emergency response arrangements with police and fire departments, hospitals and emergency response contractors.
* Emergency coordinator's address and phone number.
* On-site emergency equipment descriptions and locations.
* Evacuation plan and routes, including a site diagram.
* Spill reporting procedures.

Smaller generators (SQGs and CESQGs) also should have a contingency plan.

Tips from Inspectors

Drums

- You cannot have any mystery drums. All drums must be labeled and have a "birthdate" on them.
- Evaporation of hazardous waste is a serious violation. Do not allow the hazardous wastes to evaporate. When you are not in the process of putting waste into the drum, you must keep it closed.
- You also are required to keep the top of the drum clean.
- Do not store old drums outside. If they get stormwater inside them, you will have to sample the stormwater and determine whether the water in the drum is hazardous. Insist that the person who sold you the drum and its contents takes the drum back when you are done with it.
- Inspectors go into dumpsters and walk the entire property line of a business. They go back into trees looking for orphan drums and distressed/dead vegetation.

Spills

- Clean up your spills at the time of the spill.

Transport

- The only generators who are allowed to transport their own waste are conditionally exempt small quantity generators. All other generators must use a hazardous waste hauler that has a permit from the FDEP and the US EPA.

Waste

- The most common violation is the non-determination of whether something is a waste.
- Abandoned products are wastes.
- If you throw away containers, make sure the container is completely empty and rinsed before you place it in a waste receptacle. If you throw away aerosol cans, make sure the can has a hole in it, and that you have drained the liquids out of the can. If you are throwing away paint containers, be sure to drain all the paint out of the container.

Water

- If you discharge any waste that could be construed as a hazardous waste into a city sewer, you must have the written permission of the city sewer system. The city sewer system must be a Publicly Owned Treatment Works (POTW). It cannot be a privately owned package plant.

- If you use rags, you should send the rags to a linen service that is served by a publicly-owned sewage treatment plant. If you use paper towels, you must make a determination as to whether the used paper towels are a hazardous waste.
- Know where your drains go. All drains that lead from a hazardous materials area to a stormwater area should be sealed shut.

Checklist

This checklist will help you prevent the most common hazardous waste violations. For more detailed information on hazardous waste management requirements, contact FDEP.

- ☐ Each month, identify and record types and quantities of hazardous waste.
- ☐ Notify FDEP and obtain a US EPA identification number.
- ☐ Use proper containers to collect and store wastes.
- ☐ Label all containers, whether product or waste, as to their contents.
- ☐ Include accumulation start dates on labels.
- ☐ Keep all containers of hazardous waste or products containing regulated solvents closed at all times unless actively removing from or adding to them.
- ☐ Maintain aisle space between containers for inspection.
- ☐ Inspect containers weekly for rust, leaks or damage and keep a log.
- ☐ Train employees to properly handle hazardous wastes.
- ☐ Designate an emergency coordinator.
- ☐ Post emergency information near each phone.
- ☐ Develop a contingency plan for emergencies.
- ☐ Use manifests for all waste transported for disposal.
- ☐ Keep all records for at least three years.

Where can I get more information?

Additional information on hazardous waste reduction and regulations is available from many sources.

Florida Department of Environmental Protection

District offices and the Tallahassee office offer technical assistance, fact sheets and other publications on hazardous waste regulations.

Hazardous Waste Compliance
Assistance Program
Phone: (800) 741-4DEP
(850) 245-8707
Fax: (850) 245-8810

Available publications include:

- Summary of Hazardous Waste Regulations
- Requirements for Conditionally Exempt Small Quantity Generators
- Requirements for Small Quantity Generators
- Handbook for Small Quantity Generators of Hazardous Waste

U.S. Environmental Protection Agency

The US EPA has published a series of industry-specific guidelines and handbooks on preventing pollution and complying with hazardous waste regulations.

RCRA Hotline: (800) 424-9346

Your Trade Associations

Many trade associations have published guides to help you find solutions to your hazardous waste management problems.

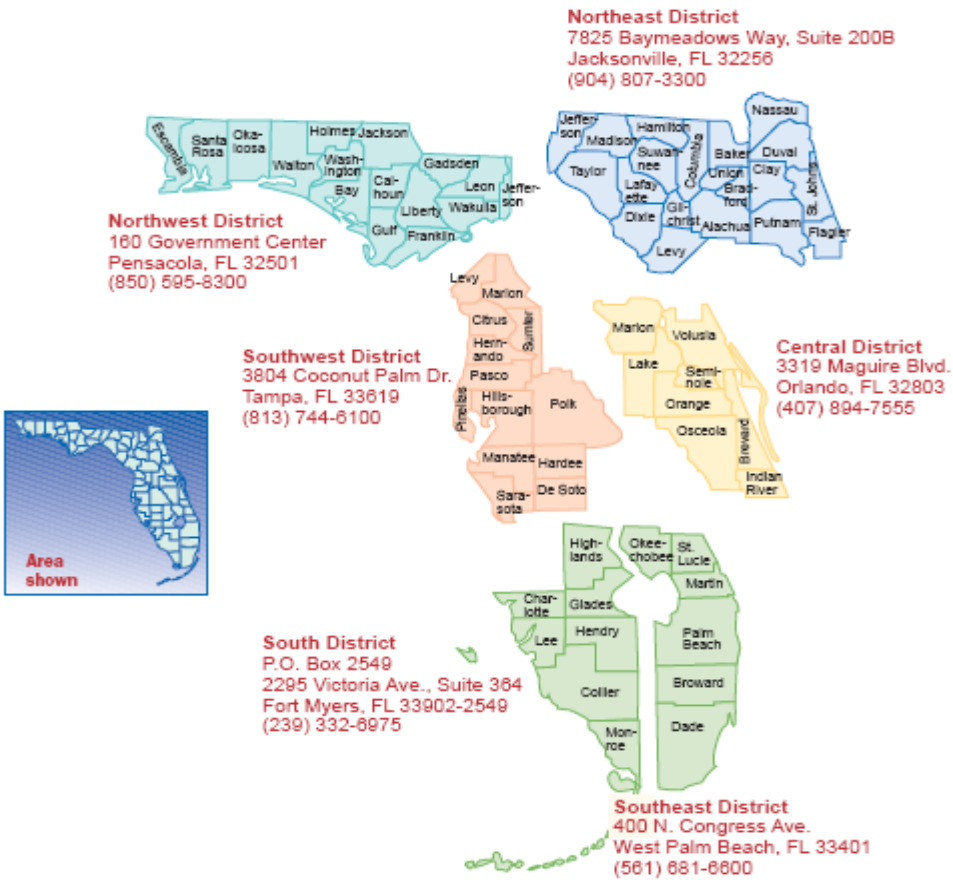
Florida Small Business Assistance Program

The Small Business Assistance Program helps businesses with environmental concerns and problems related to compliance with air regulations. Assistance is confidential and staff experts have business experience.

Phone: (800) 722-7457

Offices of the Florida Department of Environmental Protection

Hazardous Waste Regulation Section
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, FL 32399-2400
(800) 741-4DEP



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University of Florida
Florida Center for Solid and Hazardous Waste Management
2207-D N.W. 13th Street
Gainesville, FL 32609
(352) 392-6264
Fax: (352) 846-0183

Nonprofit Org
U.S. POSTAGE
PAID
Gainesville, FL
Permit No. 94

For additional information contact:
Janet Ashwood
Florida Department of Environmental Protection
Hazardous Waste Compliance Assistance Program
Tallahassee, FL
Phone: (800) 741-4337
(850) 245-8707

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Appendix M SUMMARY of HAZARDOUS WASTE REGULATIONS

Department of
Environmental Protection

Jeb Bush
Governor

Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

David B. Struhs
Secretary

SUMMARY OF HAZARDOUS WASTE REGULATIONS

This summary is provided to assist hazardous waste handlers in complying with federal and State of Florida regulations. Most of the following regulations have been in effect since November 19, 1980. Florida has adopted and incorporated portions of Title 40 Code of Federal Regulations (CFR) Parts 260-271 into its Florida Administrative Code (FAC) Rule 62-730. In some instances, FAC 62-730 is more stringent than 40 CFR.

Hazardous wastes (HW) are wastes *listed* in 40 CFR 261 Subpart D as hazardous by the U.S. Environmental Protection Agency (EPA). Or they are wastes *characterized* in 40 CFR 261 Subpart C as hazardous by exhibiting one of four characteristics: *ignitability* (i.e., an oxidizer or flash point < 140°), *corrosivity* (i.e., pH ≤ 2 or ≥ 12.5), *reactivity*, or *toxicity*. A hazardous waste determination must be made of any waste material generated (§262.11). If the material is hazardous, then it must be recycled, treated, stored, or disposed at a proper HW facility. HW cannot be disposed on or in the ground, or in local landfills, septic tanks, or injection wells. Also, regardless of quantity, the generator of HW is ultimately responsible for the waste from "cradle to grave", and can be held liable for improper management of HW even though it may have been sent to a "proper" HW management facility using a licensed transporter.

A copy of the federal hazardous waste regulations (40 CFR 260-268) can be obtained from public, college or law libraries; EPA Region 4, Atlanta Federal Center, 61 Forsyth Street, S.W., Atlanta, Georgia 30303-3104 (404/562-8579); the U.S. Government Printing Office, Washington, D.C. 20402; or the U.S. Government Printing Office, 100 West Bay Street, Suite 100, Jacksonville, Florida 32202 (904/353-0569). Copies of FAC 62-730 may be obtained from the Department of Environmental Protection (DEP).

This handout is based on DEP's understanding of the HW regulations. It should be read in conjunction with (and not as a substitute for) the federal and state HW regulations. This summary includes the principal components of the HW regulations. Regulatory requirements may change because of changes in the regulations, new interpretations or guidance from EPA or DEP, judicial rulings, etc.

Ultimately, it is the facility's responsibility to stay current with the HW regulations and be in compliance with all applicable environmental regulations. Failure to meet the applicable rules may subject facilities to more stringent standards. For example, small quantity generators (SQGs) dumping HW illegally not only become subject to disposal facility standards but will also be subject to enforcement actions. DEP has an agreement with EPA that mandates the assessment of penalties for violations of the Resource Conservation and Recovery Act (RCRA) requirements.

Many local governments have regulations and ordinances regarding the management of hazardous materials and/or wastes. Please check with those agencies for information on local requirements. New regulations may be adopted by EPA and become effective in Florida prior to adoption by DEP. In December, 1996 generators and permitted hazardous waste facilities became subject to new air emissions standards for containers, tanks and recycling

equipment. **For information and copies of new regulations, call the RCRA Hotline at 1-800-424-9346.**

TOXICITY CHARACTERISTIC

The federal regulations regarding the determination of hazardous wastes (40 CFR 261) were revised effective September 25, 1990, to replace the Extraction Procedure Toxicity Characteristic (EP Toxic) with the Toxicity Characteristic Leaching Procedure (TCLP). Information about the TC final rule can be obtained from the March 29, 1990, Federal Register (55 FR 11798 - 11877). Further information regarding the TC Rule can be obtained from the RCRA/Superfund Hotline (1/800-424-9346).

LAND DISPOSAL RESTRICTIONS

On November 8, 1984, the President signed into law the Hazardous and Solid Waste Amendments (HSWA) to the Resource Conservation and Recovery Act (RCRA). The amendments require the EPA to evaluate all listed and characteristic hazardous wastes to determine which wastes should be restricted from land disposal. These restrictions are called the Land Disposal Restrictions (LDR). As of May 8, 1990, most hazardous wastes must be treated to meet these standards prior to disposal in permitted hazardous waste landfills or surface impoundments. The LDR rule prohibits the dilution of restricted wastes as a substitute for effective adequate treatment.

Before treating a HW or disposing of it off site, the generator must determine whether the waste is subject to the LDR rules, what hazardous constituent levels are in the waste, and whether the waste must be treated or already meets the applicable treatment standard or prohibition level upon generation.

Generators who treat hazardous waste on site in tanks or containers under 40 CFR 262.34 must develop and follow a written waste analysis plan. The plan must be based on a detailed chemical and physical analysis of the waste. Records must be kept documenting treatment. Listed hazardous wastes must still be disposed of to a permitted hazardous waste landfill after treatment.

Effective August 11, 1997, EPA revised the 40 CFR 268 requirements for HW generators. For the **initial** shipment of a waste shipped off site, the generator must notify treatment and disposal facilities of the nature and hazardous constituents of each hazardous waste shipped. The written generator notice must include:

a) The initial manifest document number and all applicable EPA hazardous waste number(s) and treatability groups (See 40 CFR 268.40);

b) A list of the hazardous constituents that must be treated;

c) Waste analysis data (if available);

d) A signed certification if the generator is claiming that his waste already meets the treatment standard.

All notifications, certifications, and waste analysis data must be kept on-site for at least **three (3)** years from the date the waste was last sent to on or off site treatment or disposal. **The generator must submit a new notice if the waste or the receiving facility changes.**

The LDR rule provides for a few limited opportunities for delaying the effective date of prohibition, for a treatability variance, or for gaining an exemption from the prohibitions. Contact the EPA for additional details. This LDR explanation is a brief synopsis of a complex set of rules and regulations and is not all inclusive. Contact the EPA or DEP or review 40 CFR 268 for detailed information.

Claims that hazardous waste is exempt from regulation because it came from one or more conditionally exempt small quantity generators must be documented (FAC 62-730.030(4)). In addition, generators must keep records of hazardous wastes generated that were subsequently managed pursuant to an exclusion. This includes wastes that were generated, accumulated and then disposed of in a waste water treatment pretreatment unit or unit subject to the Clean Water Act.

USED OIL REQUIREMENTS FOR ALL GENERATORS - 40 CFR PART 279

1. Used oil may only be stored in tanks or containers.
2. Containers and tanks must be in good condition and not leaking.
3. Containers and tanks must be labeled "Used Oil."
4. Spills must be cleaned up, and contaminated materials disposed of properly.
5. Oil filters may not be disposed of to landfills. They must be recycled by an oil filter processor or municipal refuse incinerator (FAC 62-710).

HAZARDOUS WASTE REQUIREMENTS

I. **CONDITIONALLY EXEMPT SMALL QUANTITY GENERATORS (CESQG) 40 CFR 261.5.** ***CESQG's generate less than 100 kilograms of HW per month and less than 1 kilogram of acute HW (such as some pesticides, toxins or arsenic and cyanide compounds) per month.*** Many wastes that are recycled are included in this quantity determination.

1. Perform HW determination (§262.11).
2. Cannot accumulate > 1000 kg at any time.
3. Ensure delivery of HW to a proper recycling facility or TSDF.
4. Keep records documenting proper disposal (FAC 62-730).

II. **SMALL QUANTITY GENERATORS (SQG) 40 CFR 262.** ***SQG's generate 100 - 1000 kilograms of HW per month.*** Many wastes that are recycled are included in this quantity determination.

1. Obtain a DEP/EPA ID Number (§262.12) (phone 850/488-0300).
2. Use manifest system (unless there is a reclamation agreement pursuant to §262.20(e)), and ship only to a permitted facility (262, Subpart B).
3. Never exceed the 6000 kg accumulation/180 day storage time limit.
4. Emergency Planning:
   a) Have at least one employee or a designee with authority as Emergency Coordinator (EC) on 24-hour call.
   b) Next to the telephone, post
      (i) the EC name and phone number;
      (ii) fire department's number;
      (iii) location of fire extinguishers; spill control equipment/material, and fire alarm (if any).
   c) Follow emergency procedures in §262.34(d)(5), including taking necessary steps to address spills and fires, and notifying the National Response Center (24-hour number: 800/424-8802) and the State Warning Point (850/413-9911).
   d) Upon request, the DEP will provide contingency plan guidance if the facility wishes to develop a more comprehensive emergency plan than required of SQGs.
5. Training of personnel regarding proper HW handling and emergency response [§262.34(d)(5)(iii)].
6. Keep records (§262.44), including manifests, test results, etc., a minimum of three (3) years.
7. If tanks are used for management of HW, meet the tank requirements of §265.201. This includes daily and weekly inspections, required maintenance, spill response and closure standards.
8. **Meet the following requirements under III -- LQG Requirements, below:** Items 1, 2, 4, 5, 6, 12 to 15, 17, and 22.
9. If a SQG fails to meet applicable requirements, the full generator standards (and possibly TSDF standards) may apply.

III. **LARGE QUANTITY GENERATORS (LQG) 40 CFR 262.** ***LQG's generate 1000 kilograms or more of HW per month or 1 kilogram or more of acute HW (such as some pesticides, toxins or arsenic and cyanide compounds) per month.*** Many wastes that are recycled are included in this quantity determination.

1. Perform HW determination (§262.11), including LDR waste analyses (§268.7).
2. Obtain a DEP/EPA ID number (§262.12) (phone 850/488-0300).
3. Use manifest system, and ship to a permitted facility (262, Subpart B). State rules require the generator to complete areas D, F, H, I, K, O, Q, R and T on the form in addition to the other requirements.
4. Meet pre-transport requirements for packaging, labeling, marking and placarding (262 Subpart C).
5. Meet satellite accumulation rules (§262.34(c)). Close and label these containers.
6. Label containers and tanks with the words "Hazardous Waste" and label containers with accumulation start dates (§262.34(a)).
7. Do not store HW > 90 days (§262.34(b)).
8. Keep all records (§262 Subpart D) for at least three (3) years (including manifests, test data, biennial reports, etc.).
9. File a biennial report for HW shipped off site (FAC 62-730.160).
10. File exception report for late or missing manifests from the designated facility (§262.42).
11. Meet personnel training requirements, including documentation of training (§265.16).
12. Maintain and operate the facility in a clean, safe manner (§265.31).
13. Emergency equipment (§265.32).

    a) telephone or hand-held two-way radio;
    b) internal communication or alarm system;
    c) fire and spill control equipment (e.g. fire extinguishers, hoses, sprinklers, etc.);
    d) neutralizing agents, spill adsorbents, overpack drums, standby 55-gallon drums, etc.;
    e) test and maintain the emergency equipment (§265.33).

14. Maintain adequate aisle space for evacuation, inspecting drums, etc. (e.g. no less than three (3) feet) (§265.35).

15. Attempt to make arrangements with local fire and police departments, hospitals, and emergency response contractors/equipment suppliers, with regards to emergency arrangements, hazards of materials handled, layout of facility, etc. (§265.37).

16. Have a contingency plan meeting the requirements of 265 Subpart D. Upon request, DEP will provide contingency plan guidance. Emergencies that require implementation of the contingency plan must be reported to DEP. Updated contingency plans must be distributed when facility conditions or emergency coordinators change.

17. Containers (e.g. drums, cans, etc.) must be kept closed and in good condition, inspected at least weekly, be compatible with the HW stored, and separated from other incompatible wastes (e.g. keep cyanides away from acids) (265 Subpart I). **Records must be kept of these inspections (FAC 62-730.160).**

18. Ignitable or reactive HW must be stored at least fifty (50) feet from the facility's boundary line (265 Subpart I).

19. Tanks must meet the requirements of 265 Subpart J (structural integrity; containment and detection of releases; inspections; response to leaks or spills; operating requirements; closure and post-closure care; special requirements for ignitable, reactive and/or incompatible wastes; waste analysis and trial tests).

20. Special cautions (including "no smoking" signs) are required for ignitable or reactive wastes (§265.17).

21. Security (e.g. a locked fence) and bermed containment areas (with roof and impermeable floor) for HW storage areas are strongly recommended.

22. A Land Disposal Restrictions (LDR) Certification or Notification must accompany the initial manifest for a restricted waste. Generators who treat waste to meet land disposal restrictions must submit a waste analysis plan to DEP (§268.7).

23. Meet applicable air emission standards under 40 CFR 265 Subparts AA, BB and CC.

It is the facility's responsibility to comply with Occupational Safety & Health Administration (OSHA) worker safety and protective clothing rules; fire codes; Florida's Right to Know Law; Superfund Amendments and Reauthorization Act (SARA); etc.

HAZARDOUS WASTE MAY NEVER BE DISPOSED OF IN SEPTIC TANKS OR ON THE GROUND AT FACILITIES THAT DO NOT HAVE HAZARDOUS WASTE PERMITS.

HAZARDOUS WASTE MAY ONLY BE BURNED IN PERMITTED HAZARDOUS WASTE INCINERATORS. DO NOT DISPOSE OF HAZARDOUS WASTE BY EVAPORATION.

IV. TRANSPORTERS (40 CFR 263) (FAC 62-730).

1. Obtain ID number (§263.11) (phone 850/488-0300).
2. Use manifest system (263 Subpart B).
3. Ability to clean up hazardous waste discharges during transportation-related incidents (263 Subpart C).
4. Provide annual documentation of financial responsibility (FAC 62-730.170).
5. Submit annual status update to DEP (FAC 62-730.170).
6. Transporters storing waste > 24 hours at a transfer facility must notify DEP and meet many TSDF requirements (FAC 62-730.171), including containment, operating record, contingency plan, training, security, and closure.
7. All transfer facilities operated in the state must have a unique ID number (FAC 62-730.171).
8. Transfer facilities must submit closure plan and contingency plan to DEP (FAC 62-730.171).
9. Transfer facilities must maintain a written record of when all hazardous waste enters and leaves the facility (FAC 62-730.171).

FLORIDA'S HAZARDOUS WASTE REGULATIONS FOR TRANSPORTERS AND TRANSFER FACILITIES ARE MORE STRINGENT THAN THE FEDERAL REGULATIONS.

V. TREATMENT, STORAGE AND DISPOSAL FACILITIES (TSD) (40 CFR 264 or 265).

1. Obtain a DEP/EPA ID number (§264.11).
2. Obtain a HW permit unless exempt (e.g. wastewater treatment units, elementary neutralization, etc.) and comply with permit conditions. Facilities receiving HW from off-site (including some recycling facilities) may be subject to TSDF requirements.
3. Must meet applicable generator standards (III, above).
4. Comply with general facility standards, including waste analyses, security, inspections, and personnel training (264 Subpart B).

5. Maintain emergency equipment, adequate aisle space, and make arrangements with local authorities (264 Subpart C).
6. Have a contingency plan meeting the requirements of 264 Subpart D.
7. Use manifest system and comply with recordkeeping requirements (264 Subpart E).
8. Comply with groundwater monitoring requirements (264 Subpart F).
9. Comply with closure and post-closure requirements (264 Subpart G).
10. Maintain financial assurance for closure, post closure (if applicable) and liability (264 Subpart H).
11. Comply with container management standards (264 Subpart I).
12. Comply with tank management standards (264 Subpart J).
13. Comply with additional requirements for individual units such as surface impoundments, waste piles, containment buildings, incinerators, drip pads, etc. (264 Subpart K - 264 Subpart DD).
14. Meet applicable air emission standards (264 Subparts AA, BB, and CC, Subpart CC effective December 1996).
15. Meet applicable LDR requirements for treatment facilities, or as generators for wastes sent off site for further treatment (Part 268).

VI. MANIFEST FORMS

Title 40 CFR Part 262 Subpart B requires the use of the Uniform Hazardous Waste Manifest (EPA Form 8700-22 and 8700-22a) for hazardous waste shipments. Florida adopted 40 CFR 262 Subpart B by reference in FAC 62-730.160(1).

Obtaining Manifest Forms

Florida does not supply manifests, but does supply a list of vendors from which copies of the manifest may be obtained. Copies may also be available from hazardous waste transporters or hazardous waste management facilities.

Manifest Copies

40 CFR 262.22 requires the manifest to consist of a copy for:

1. the generator;
2. each transporter;
3. the owner/operator of the designated facility; and
4. a signed copy to be returned to the generator by the designated facility.

For regular shipments of hazardous waste, Florida does not require the submission of a manifest copy to DEP. However, manifests must be retained for **three (3)** years and are reviewed as part of hazardous waste compliance inspections conducted by DEP.

When hazardous wastes are shipped under an emergency EPA/DEP identification number, as defined in FAC 62-730.161, the generator must send a legible copy of all signed and returned manifests to DEP within 45 days of the last shipment.

The owner/operator of a designated facility must submit to DEP any manifests for which a significant discrepancy is discovered, as defined in 40 CFR 264.72 and 40 CFR 265.72, if the discrepancy is not resolved within 15 days.

A large quantity generator must submit a legible copy of a manifest to DEP if he has not received a copy of the signed manifest from the designated facility within 45 days of shipment. A small quantity generator must submit a legible copy of a manifest to DEP if the signed manifest is not received from the designated facility within 60 days of shipment.

Completing the Manifest

Florida requires the completion of the following sections of the manifest in addition to those required by federal regulations in accordance with Appendix I of 40 CFR 262. Waste codes are listed in 40 CFR 261 Subparts C and D.

Form 8700-22

Items 1 - 16

D and F - Transporter phone numbers

H - Facility phone number

I - Waste codes for each waste stream

K - Handling codes for wastes

Form 8700-22a

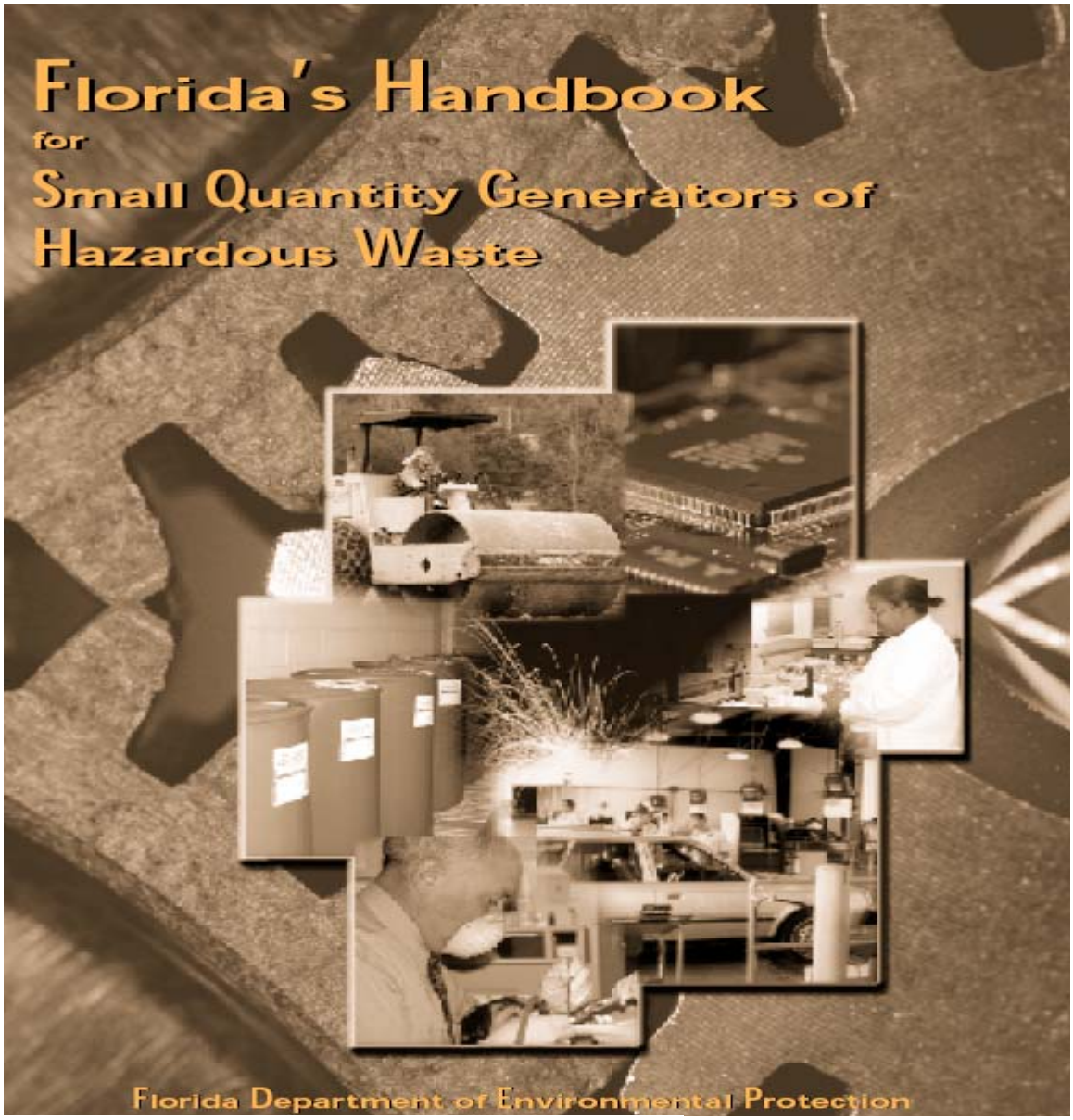
Items 21-32

O and Q - Transporter phone numbers

R - Waste codes for each waste stream

T - Handling codes for wastes

Appendix N **FLORIDA'S HANDBOOK for SMALL QUANTITY GENERATORS of HAZARDOUS WASTE**



This handbook explains the State of Florida requirements for small quantity generators of hazardous waste (SQG). It was prepared by the Office of Environmental Education and the Hazardous Waste Management Section of the Florida Department of Environmental Protection.

For additional copies contact:

The Florida Department of Environmental Protection
Bureau of Solid and Hazardous Waste
2600 Blair Stone Road, MS 4555
Tallahassee, Florida 32399-2400
850-488-0300
www.dep.state.fl.us/dwm/programs/hazardous

Rev. December-2000

Table of Contents

Pollution Prevention

Did you know that you always remain responsible for the hazardous waste you generate? By learning more about hazardous waste disposal, you can eliminate some of the worries associated with this liability.

As counties and the Florida Department of Environmental Protection (DEP) increase their education and compliance and enforcement efforts, more small quantity generators will receive on-site visits. Through the site visits and open communication, you can learn how to protect the environment and avoid costly penalties that may be imposed for environmental infractions.

Sending your hazardous waste off-site for proper management is expensive. These costs will only increase as time goes on and as regulations become stricter. This means that learning proper waste management not only helps the environment, but also your budget.

Pollution prevention is the best approach. While the elimination or reduction of all wastes may not be currently feasible, this handbook provides some simple suggestions to get you started.

If you would like more information or technical assistance on pollution prevention, contact DEP's Pollution Prevention Program at 850-488-0300. Remember it's to your advantage to eliminate or reduce your hazardous waste and toxic emissions.

- **Pollution**: the contamination of air, soil, or water by the discharge of harmful substances.
- **P2**: the efficient use of resources (such as energy, raw materials, and water) to reduce or eliminate the discharge of substances that could harm our community.

Inventory Management

- Take an inventory of all hazardous chemicals used. Consider if you need them.
- Purchase fewer toxic and more non-toxic chemicals.
- Purchase only the quantity that you need.
- Tightly cover any storage containers holding volatile chemicals.

Process Modification

- Use more non-toxic chemicals as raw materials.
- Modify processes to reduce hazardous emissions and waste generation; e.g. reduce the water flow in cleaning operations, replace water cleaning with mechanical methods, or install closed-loop systems for recycling processed wastewater.
- Improve equipment efficiency.
- Perform regular preventive maintenance on equipment.
- Involve employees and get feedback from them.

Recovery and Reuse

- Recover and recycle hazardous waste on site.
- Reuse waste in the process.
- Participate in a waste exchange (see below).

Waste Exchange

A network of waste exchanges exists throughout the country. In the southeastern region, there is the Southern Waste Information Exchange (SWIX). By contacting the waste exchange, your waste may be listed in a publication that is circulated to other generators, recyclers and waste brokers. If a business can use your waste, you will be contacted through the exchange.

This alternative can help reduce your waste management costs. For further information contact:

Southern Waste Information Exchange at
P.O. Box 960, Tallahassee, Florida, 32302
800-441-7949
www.wastexchange.org

Why Should I Be Concerned About Small Quantities Of Hazardous Waste?

Introduction

The purpose of this handbook is to provide information to business, industry and public agencies that may be generators of small quantities of hazardous waste and to inform them of their responsibilities for proper hazardous waste management.

This handbook will help you to determine:

- whether or not you generate hazardous waste,
- if your wastes are regulated under Florida law,
- what you must do to comply with state and federal regulations as a small quantity generator,
- how to manifest your hazardous waste for shipment and
- how to dispose of your hazardous waste properly.

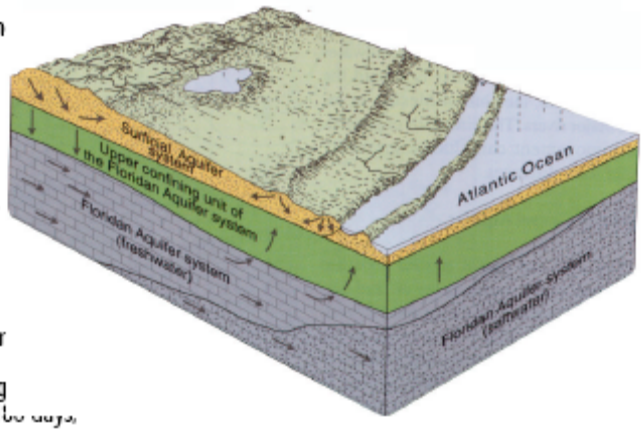
Resource Conservation and Recovery Act

In 1976 the U.S. Congress enacted the Resource Conservation and Recovery Act (RCRA) to protect public health and the environment from improper management of hazardous waste. RCRA was written primarily to regulate hazardous waste managed by the larger generators. Since the initial enactment, RCRA has been amended to regulate the previously exempted small quantity generators.

Small Quantity Generator Regulations

Because of Florida's shallow aquifer, even small amounts of hazardous waste can seep into the groundwater and contaminate the drinking water supply.

The State of Florida adopted by referen the federal regulations governing small quantity generators. The EPA published these regulations in the Federal Register on March 24, 1986. The small quantity generator (100-1,000 kilograms of waste per month) is required to:



- use a multiple copy manifest,
- obtain an EPA/DEP identification num
- accumulate no more than 6,000 kilog of hazardous waste for longer than 1[illegible] days,
- implement a Preparedness and Prevention Plan,
- use a DEP-approved transporter for off-site shipment of hazardous waste,
- dispose hazardous waste only at a permitted RCRA facility,
- maintain a copy of the manifest for a period of three years,
- file an exception report if a copy of the manifest is not returned from the disposal facility within 60 days of the date the waste was shipped.

Businesses that are likely to produce hazardous waste are involved in these types of activities

- Repair and maintenance of motor vehicles
- Electroplating
- Operation of printing and copying equipment
- Dry cleaning and laundering services
- Processing photographs
- Operation of laboratories
- Medical facilities
- Building, road construction, and demolition
- Pest control services
- Preserving wood
- Making or refinishing furniture

Hazardous waste can be generated when:

- waste materials such as printing inks, paints, spent solvents, waste degreasers, cleaning compounds, or by-products of chemical processes are discarded or have an expired shelf life.

or

- products containing hazardous materials are damaged during shipment.

How Can I Determine If I Have Hazardous Waste?

All generators of waste materials are required by law to identify and evaluate their waste. RCRA in Title 40 Code of Federal Regulations (CFR) Part 261, contains lists specifying wastes that are regulated and characteristics for identifying non-listed hazardous waste. You can find more information at the U.S. Printing Office or DEP (page 20).

Are my wastes specifically listed as hazardous waste?

The EPA lists hazardous wastes beginning in 40 CFR 261.30. These wastes come from non-specific or specific sources or are discarded or off-spec commercial chemical products and residues. Some listed wastes are so dangerous that they can be very toxic in small amounts. These are called **acute hazardous wastes**.

Does my waste possess a hazardous characteristic?

Your waste may not be a listed hazardous waste but may be identified as one if it exhibits any of the four characteristics of a hazardous waste.

1. Ignitability: The waste material (solid, gas or liquid) must have a flashpoint of less than 140° F and/or be an aqueous solution with an alcohol content greater than or equal to 24%. Examples are solvents, paint thinners and oxidizers. The hazardous waste number is D001.

2. Corrosivity: The waste material must be a liquid and have a pH of less than 2.0 or greater than 12.5. Examples are acids and caustics. The hazardous waste number is D002.

3. Reactivity: The waste material is reactive to water, shock, heat and pressure, and undergoes a rapid or violent chemical reaction. Examples are perchlorates, peroxides and cyanides. The hazardous waste number is D003.

4. Toxicity Characteristic (TC): This category includes eight heavy metals and thirty-one organic chemicals, including ten pesticides. Waste in this category need only contain very small amounts of arsenic, lead, mercury or one of the other heavy metals, or organics such as benzene, trichloroethylene, perchloroethylene, vinyl chloride, methyl ethyl ketone or any one of the ten pesticides. These have hazardous waste numbers D004 - D043.

Still confused on identifying your wastes?

You may have accumulated waste that you suspect to be hazardous, but for some reason, the product information is not available. Your only alternative is to have a commercial testing laboratory sample and test your waste.

Ask the lab to perform only those tests needed to determine the waste type and the hazardous characteristics. The cost of analysis will depend upon the complexity of the tests needed to determine whether or not the waste is hazardous. Reduce your analytical costs by providing the laboratory with as much information as possible about the constituents of the waste.

Steps for waste identification:

- Check the Material Safety Data Sheet for product information.
- Check with your supplier/manufacturer.
- Read the product label.
- Compare product information with the listed wastes and hazardous waste characteristics in 40 CFR 261.

Should I notify DEP of my hazardous waste?

Businesses generating 100-1,000 kilograms per month of listed or characteristic hazardous waste are subject to regulation and must notify the DEP of their activities on EPA Form 8700-12, Notification of Regulated Waste Activity. You can obtain forms and instructions by writing to:

Florida Department of Environmental Protection
Hazardous Waste Regulation Section
Hazardous Waste Notification Coordinator
2600 Blair Stone Road, MS 4560
Tallahassee, FL 32399-2400

These forms are also available at DEP's web site at www.dep.state.fl.us\dwm\programs\hazardous

How Do I Determine If I Am A Small Quantity Generator?

The law says:

A small quantity generator is one who generates less than 1,000 kilograms (kg) of hazardous waste in a calendar month. RCRA further defines small quantity generators into two separate groups:

- 100-1,000 kilogram/month (220-2,200 pounds) small quantity generators (SQG)
- Conditionally Exempt Small Quantity Generators (CESQG) 100 kilogram/mo. (220 pounds) or less

Which generator category do I belong to?

The amount of all hazardous waste generated and/or accumulated at your place of business will determine your category. Each category has its own requirements for waste management.

To determine your correct generator status, you are required to count any hazardous waste:

- accumulated prior to recycling, transporting, long-term storage, treatment or disposal;
- transported off site for treatment, storage or disposal, or is
- treated or disposed of on site (unless exempt).

You don't have to count:

- spent lead acid batteries that will be sent off site for reclamation,
- used oil that has not been mixed with hazardous waste and is recycled,
- Petroleum Contact Water managed in accordance with Chapter 62-740, Florida Administrative Code, (F.A.C.)
- waste antifreeze that is recycled in accordance with DEP guidelines or
- hazardous waste batteries, pesticides and mercury lamps and devices managed in accordance with the EPA Universal Waste Rule (40 CFR Part 273) and Chapter 62-737, F.A.C.

HAZARDOUS WASTE GENERATOR CATEGORIES

Conditionally Exempt Small Quantity Generator (CESQG) Limits

In any one month a CESQG generates:

- no more than 100 kilograms (220 pounds) (about half a 55-gallon drum, or about 25 gallons)*
  or
- less than 1 kilogram of an **acute hazardous waste** (e.g. arsenic and cyanide compounds)
  and
- never accumulates more than 1,000 kilograms (2,200 pounds) of hazardous waste at any time.

no more than

in any one month

Small Quantity Generator (SQG) Limits

In any one month a SQG generates:

- more than 100 kilograms (220 pounds) but less than 1,000 kilograms (2,200 pounds) (approximately one-half drum to 5 drums or 25 to 250 gallons).*

less than

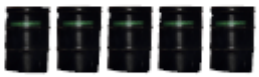
in any one month

Large Quantity Generator (LQG) Limits

In any one month a LQG generates:

- 1,000 kilograms (2,200 pounds) or more (approximately 5 full drums, or 250 gallons or more)*
  or
- 1 kilogram or more of an **acute hazardous waste**.

more than



in any one month

A generator is a CESQG if it generates no more than 100 kilograms of hazardous waste in any calendar month. If it exceeds the 100 kilograms per month or accumulates 1,000 kilograms at any one time, it is subject to the requirements of a small quantity generator.

Although a CESQG is not subject to manifesting and disposing of its hazardous waste at a permitted RCRA facility, it is still responsible for the proper management of these wastes.

Many counties have hazardous waste collection centers that will accept hazardous waste from conditionally exempt small quantity generators for a reduced fee during scheduled collections.

Contact your solid waste agency or DEP for more information (page 20).

* These volume limits are based on the weight of water (8 pounds/gallon) and are only provided for the purpose of estimating one's status. Heavier wastes like heavy metal sludges (20 pounds/gallon) and chlorinated solvents such as perchloroethylene, freon, and trichloroethylene (12-13.5 lb./gallon) need to be evaluated based on their actual weight per gallon.

How Can I Properly Manage My Hazardous Waste?

Inventorying, accumulating, preparing emergency procedures and prevention plans and proper storage and handling are all part of good waste management practices. This chapter describes these practices.

Keep an inventory of your wastes

The amount of hazardous waste you generate determines the regulations to which you are subject.

The following management requirements are primarily for the 100-1,000 kilograms per month small quantity generator but are **recommended for** the conditionally exempt small quantity generator.

As part of responsible management, you must maintain a written record of the first date of accumulation and the amount, type and number of containers of each hazardous waste you generate.

Place each waste type in a separate container. Do not mix different wastes together because doing so can increase the cost of identifying, testing, disposing or recycling the contents.

Limits to waste accumulation

As a small quantity generator, you are allowed to store on site a total of 6,000 kilograms (13,200 pounds) of hazardous waste for a period of 180 days. Allow ample time before the expiration date to make arrangements for disposal with a hazardous waste transporter.

You will be subject to more stringent requirements if at any time you accumulate or store more than 6,000 kilograms for longer than 180 days.

What is a Preparedness and Prevention Plan?

If you accumulate hazardous waste, you are required to prepare a Preparedness and Prevention Plan.

Preparedness and Prevention Plan Requirements

- Maintain and operate your business to minimize the possibility of fire, explosion or any unplanned release of hazardous waste into the environment.
- Be equipped with a telephone or similar communication device to summon help.
- Have fire extinguishers and spill-control equipment on hand. This equipment must be tested and maintained to assure proper functioning.
- All persons involved in the handling operation of hazardous waste must have immediate access to either internal or external alarm or communication equipment.
- Maintain sufficient aisle space in all work areas to allow the unobstructed movement of personnel and equipment in case of an emergency.
- Familiarize police, fire departments, state emergency response teams and hospitals of the type of waste handled at your facility.

What are Contingency Plans and Emergency Procedures?

Small quantity generators are required to develop a modified contingency plan and emergency procedures. These requirements are intended to ensure that your employees are adequately prepared to handle hazardous waste and to respond to any emergencies that might arise.

Contingency Plans and Emergency Procedures Requirements

- An emergency coordinator must be on-site or on call at all times.
- Next to the telephone post the name and phone number of the emergency coordinator, the location of fire extinguishers and spill-control material and the phone number of the fire department.
- Ensure that all employees are thoroughly familiar with proper waste handling and emergency procedures.
- The designated emergency coordinator must respond to any emergencies that arise.
- When an emergency occurs serious enough to warrant help from the fire department (or you have knowledge of a hazardous waste spill that could threaten the public health or the environment) you must:
  - √ notify the Division of Emergency Management State Warning Point with Department of Community Affairs, 800-320-0519,
  - √ file a report with the appropriate DEP district office and
  - √ notify the National Response Center, 800-424-8802.

Storage Containers

When handling and storing hazardous waste, you should establish good housekeeping practices to avoid possible spills. Follow these requirements for handling storage containers:

- Containers must be in good condition.
- Replace leaking containers.
- Containers must be compatible with the hazardous waste stored in them, and must meet U.S. Department of Transportation standards.
- Containers holding hazardous waste must be closed during storage.
- Do not handle containers in a haphazard way that could cause leaking or rupture.
- Inspect containers at least weekly to check for leaks and signs of corrosion.
- Incompatible wastes must not be placed in the same container. This can cause fires, leaks or other reactions.
- Mark each container with the date that storage began and with the words "Hazardous Waste."

Storage Tanks

Rather than store hazardous waste in containers, you may choose to use storage tanks. To safely manage your waste in storage tanks follow these requirements:

- Do not place wastes in tanks if the wastes can cause the tank to fail. For example, incompatible wastes must not be placed in the same tank.
- Reactive and ignitable wastes must be stored or treated in a way that will protect them from reacting or igniting.
- Uncovered tanks must have at least two feet of freeboard or have secondary containment to prevent spillage.
- Every day inspect discharge control equipment and data gathered from monitoring equipment, and measure the level of waste to maintain compliance with the freeboard requirement. Every week inspect the tank and the area immediately surrounding the tank to detect corrosion or obvious signs of leakage.
- Equip tanks that have an automatic waste feed with discharge control equipment.
- Mark each tank with the date storage began and the words "Hazardous Waste."

Trade Association

Your trade association can be a good source of information on hazardous waste management practices. It can provide you assistance in handling, packaging and labeling your waste. Some publish periodic newsletters that can include tips on properly managing hazardous waste.

How Do I Manifest and Transport My Hazardous Waste?

Disposal of hazardous waste in solid waste landfills is prohibited in Florida. You must ship it to a permitted hazardous waste recycling, treatment or disposal facility. This chapter will assist you in completing a hazardous waste manifest, packaging and shipping waste, and selecting a permitted facility.

The Uniform Hazardous Waste Manifest

The Uniform Hazardous Waste Manifest (page 18) is a special shipping document that must accompany hazardous waste shipments. The state of Florida requires the use of this manifest except when hazardous waste is recycled (see Reclamation Agreement, page 16).

The following items must be completed:

Item #1 Your EPA/DEP identification number

Item #3 Generator name and address

Item #5 Transporter and its ID number

Item #9 Designated facility name, site address

Item #10 Designated facility ID number

Enter the company name and site address of the facility to which you are shipping the waste listed on the manifest. The address must be the site address, which may be different from the company mailing address.

Item #11 U.S. Department of Transportation (U.S. DOT) description

Enter the U.S. DOT proper name, hazard class and UNNA (United Nations/North American) number for each waste identified in 49 CFR Parts 171-177. The transporter or the facility to which you are shipping the waste may be able to help you determine this information; however, it is your responsibility to correctly fill out the manifest (see Code of Federal Regulations, page 20).

Item #12 Containers

Enter the number of containers for each waste and the appropriate abbreviation for the type of container.

DM .....metal drums, barrels, kegs	DT .....dump truck
DW .....wooden drums, barrels, kegs	CY .....cylinders
DF .....fiberboard, plastic drums, barrels, kegs	CM .....metal boxes, cartons, cases
	CW .....wood boxes, cartons, cases
TP .....tank portable	CF .....fiber or plastic boxes, cartons ,cases
TT .....cargo tanks (tank trucks)	BA .....burlap cloth, paper or plastic bags
TC .....tank cars	

Item #13 Total Quantity

Enter the total quantity of waste described on each line. Your measurement must include the weight of the waste container when discarded. Do not use fractions or decimals; round off to the next whole number.

Item #14 Unit

G .....gallons	L .....liters
P .....pounds	K .....kilograms
T .....tons (2000 pounds)	M .....metric tons (1000 kilograms)
Y .....cubic yards	N .....cubic meters

Enter the appropriate abbreviation for each quantity listed under Item #13.

Items D, F, H, I and K
Transporter's Phone, Facility's Phone, Waste Number and Handling Codes

Enter the phone number(s) of the transporter(s) and facility you use to manage hazardous waste in shaded areas D, F and H. In shaded area 1, enter the specific EPA Waste number for the wastes (left in Item 11). These numbers and associated wastes are listed in 40 CFR Part 261. Enter in shaded area K the handling codes (below) for the management methods used by the facility **receiving** the waste.

M01 .....metals recovery (for reuse)	M09 .....aqueous organic and inorganic treatment
M02 .....solvents recovery	M10 .....sludge treatment
M03 .....other recovery	M11 .....stabilization
M04 .....incineration	M12 .....other treatment
M05 .....energy recovery (reuse as a fuel)	M13 .....disposal
M06 .....fuel blending	M141 .....transfer facility storage
M07 .....aqueous inorganic treatment	
M08 .....aqueous organic treatment	

Item #16 Generator's Certification

You must sign and date the Uniform Hazardous Waste Manifest.

Obtaining an EPA Identification Number

As a small quantity generator, you are required to obtain an EPA/DEP identification number by completing and submitting EPA Form 8700-12, Notification of Regulated Waste Activity. You can obtain these forms from the DEP (page 20).

This identification number is required on the manifest when you are shipping waste.

Packaging and Labeling

When hazardous wastes are shipped off site, the packaging and labeling of these wastes must meet U.S. Department of Transportation (DOT) shipping requirements.

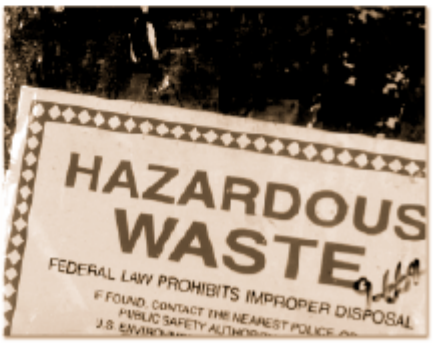
The generator may rely upon the product manufacturer or the transporter for packaging and labeling information. The transporter may also provide packaging of the waste as a service to the generator as part of the transportation cost.

Specific packaging and labeling requirements are listed in 49 CFR Parts 171-179. You can obtain copies through the Superintendent of Documents, U.S. Government Printing Office (page 20).

Each container must display the appropriate diamond shaped DOT label. These labels correspond to DOT hazardous material classifications: flammable, corrosive, reactive and toxic.

Each container **must** be marked with the following:

- "Hazardous Waste - Federal Law Prohibits Improper Disposal. If found, contact the nearest police or public safety authority or the U.S. Environmental Protection Agency."
- Generator's Name and Address
- Manifest Document Number
- Proper DOT shipping name and identification number



Land Disposal Restrictions

Land disposal of any hazardous waste is prohibited until it has been treated to meet federal treatment standards. The 100 to 1,000 kilograms per month small quantity generator must send a one-time signed notification to the hazardous waste facility receiving the hazardous waste that the waste **does not meet** the treatment standard, or must send a one-time signed notification to the facility saying that the waste **meets** the treatment standard. An updated notification is required only if the generator's waste or the receiving facility changes. The notification or certification can be attached to the manifest.

Dilution of a hazardous waste to avoid the required treatment is prohibited. All notices, certifications, analysis and other documentation required by 40 CFR Part 268.7(a) must be retained on site for at least three years.

Reclamation Agreement

If your spent hazardous waste is recycled, the manifest can be exempted if you and your recycler have a reclamation agreement meeting these conditions:

- You must have a written agreement with a recycler to collect and reclaim specified waste and to deliver regenerated material back to you on a specified schedule.
- The recycler must own and operate the vehicle that is used for transporting the waste and regenerated material.
- Either you or the recycler must retain ownership of the waste material.
- You and the recycler must retain a copy of the contractual agreement and a copy of each shipping document.
- The shipping document is to include the name, address and EPA/DEP identification number of the generator; the quantity of waste; all DOT shipping information; and the date waste was transported by recycler.

Selecting a transporter

When selecting a transporter, you need to know if the transporter has obtained an EPA identification number and if the proper liability insurance coverage (as required by DEP) has been obtained. Confirm this information by contacting DEP's Hazardous Waste Management Section (page 20).

Small quantity generators can contract with a transporter that does "milk runs." These milk runs are scheduled by the transporter to pick up shipments of hazardous waste from several small quantity generators within a given area.

Some commercial companies that transport their own hazardous waste will also provide transport services to others. When contacting these companies be sure to let them know what type of hazardous waste you are disposing.

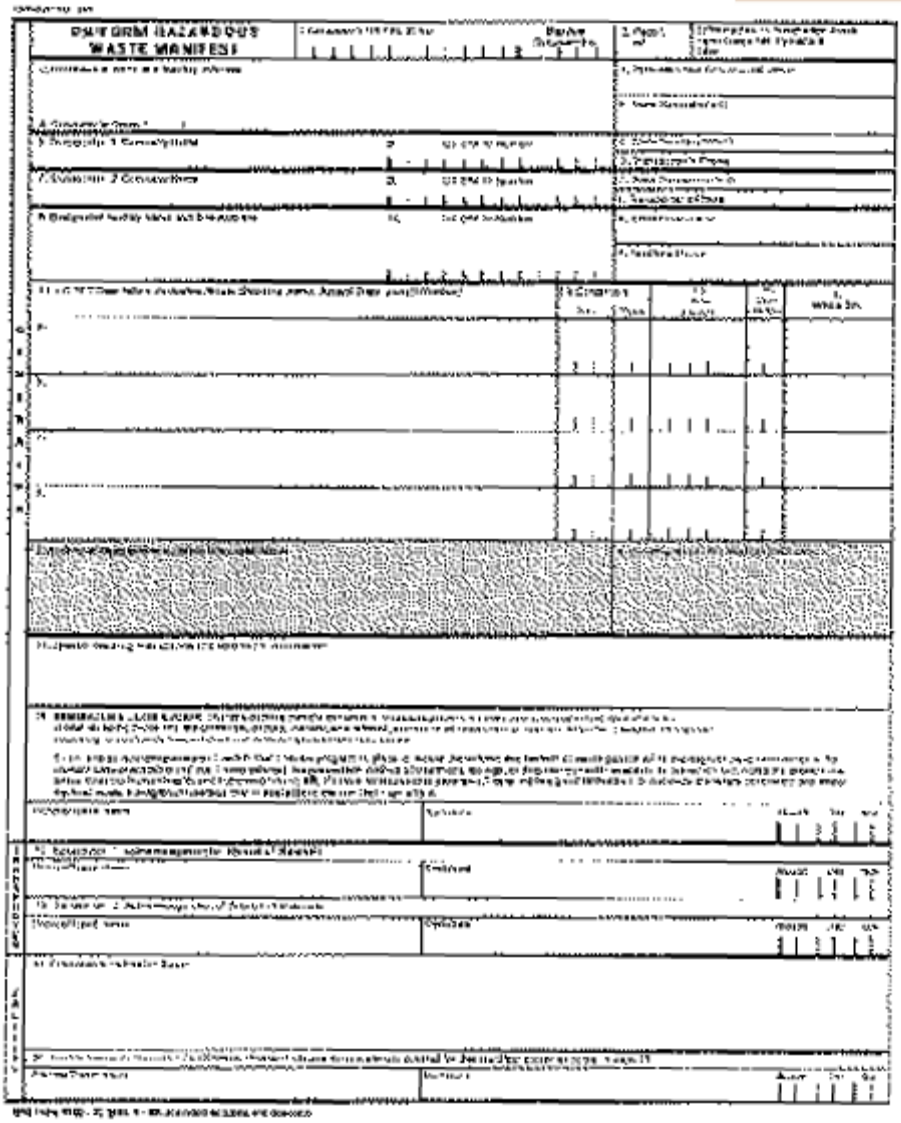
Selecting a recycling, treatment or disposal facility

Your transporter can provide you with a choice of recycling, treatment or disposal facilities. Verify that the facility is permitted to receive your waste by contacting DEP's Hazardous Waste Management Section (page 20). Without verification you take a risk of shipping your waste to a facility that may refuse your waste and have your shipment returned to you.

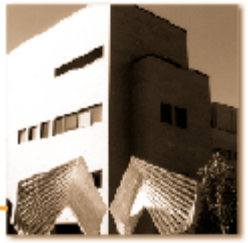
May I handle my wastes on my own property rather than ship them away for disposal?

You may handle your wastes on your own property if you are permitted to do so by DEP. To obtain a permit to treat, store or dispose of hazardous waste, you should contact the DEP district office in your area (page 19).

Uniform Hazardous Waste Manifest



Offices of the Florida Department of Environmental Protection



Northwest District
160 Government Center
Pensacola, FL 32501-5794
850/444-8300 (SC 695-8300)

Northeast District
7825 Baymeadows Way
Suite B200
Jacksonville, FL 32256-7590
904/448-4300 (SC 880-4300)

N.E. Dist. Branch Office
101 N.W. 75th St.
Suite 3
Gainesville, FL 32607-1429
352/333-2850 (SC 637-2850)

N.W. Dist. Branch Office
2353 Jenks Ave.
Panama City, FL 32405
850/872-4375 (SC 777-4375)

N.W. Dist. Branch Office
2815 Remington Green Cir.
Suite A
Tallahassee, FL 32308-1513
850/488-3704 (SC 278-3704)

Central District
3319 Maguire Blvd.
Suite 232
Orlando, FL 32803-3767
407/894-7555
(SC 325-2290)

Central Dist. Branch Office
13 East Melbourne Ave.
Melbourne, FL 32901
407/984-4800
(SC 350-4800)

Southwest District
3804 Coconut Palm Dr.
Tampa, FL 33619-8318
813/744-6100 (SC 512-1042)

S.W. Dist. Satellite Office
170 Century Blvd.
Bartow, FL 33830-7700
941/533-1448 (SC 572-6200)

S.W. Dist. Satellite Office
6700 Clark Rd.
Sarasota, FL 34241
941/361-6178

Southeast District
400 N. Congress Ave.
P.O. Box 15425
West Palm Beach, FL 33416
561/681-6600
(SC 236-6600)

S.E. Dist. Branch Office
1801 S.E. Hillmoor Dr.
Suite C-204
Port St. Lucie, FL 34952
561/871-7662
(SC 222-7662)

South District
2295 Victoria Ave.
Suite 364
P.O. Box 2549
Ft. Myers, FL 33901
941/332-6975 (SC 765-6815)

South Dist. Branch Office
7451 Golf Course Blvd.
Punta Gorda, FL 33982
941/575-5814 (SC 765-5815)

South Dist. Branch Office
2796 Overseas Highway
Suite 221
Marathon, FL 33050
305/289-2310 (SC 468-2310)

David B. Struhs, Secretary
Florida Department of Environmental Regulation

John M. Ruddell, Director
DEP Division of Waste Management
Twin Towers Office Building 2600 Blairstone Road
Tallahassee, Florida 32399-2400
850-487-3299 www.dep.state.fl.us

Information Assistance

24-Hour National Spill Reporting Center
National Response Center
800-424-8802 www.nrc.uscg.mil

Florida Department of Community Affairs
Division of Emergency Management
State Warning Point (24 hours)
Emergency assistance for reporting spills and other hazardous materials incidence
800-320-0519, 850-413-9900, 850-413-9911 or 850-413-9912
www.dca.state.fl.us/cps/SERC/serc.htm

Florida Dept Of Environmental Protection Hazardous Waste Management Section
Hazardous Waste and Used-Oil/Special Wastes Transporters
850-488-0300
Hazardous Waste: www.dep.state.fl.us/dwm/progams/hazardous
Used-Oil: www.dep.state.fl.us/dwm/progams/used-oil
Mercury: www.dep.state.fl.us/dwm/progams/mercury

Florida Dept Of Environmental Protection Office of Ombudsman
For general information or specific questions.
850-921-1222 www.dep.state.fl.us/officsec/ombud

Florida Dept Of Environmental Protection Pollution Prevention Program (P2 Program)
850-488-0300
www.dep.state.fl.us/waste/programs/p2

Florida Dept Of Environmental Protection Small Business Assistance Program
800-SBAP-HLP or 800-722-7457
www.dep.state.fl.us/air/outreach/sbap/

Florida Department of Transportation (DOT)
Motor Carrier Compliance
Labeling & packaging information
850-488-7920 www.dot.state.fl.us

U.S. EPA Federal Regulations RCRA Superfund EPCRA Hotline
800-424-9346 or 703-412-9810
www.epa.gov/epaoswer/hotline

U.S. EPA, Region IV
61 Forsyth Street, S.W.
Atlanta, GA 30303
800-241-1754 or 404-562-9900 www.epa.gov/region4

U.S. EPA Small Business Assistance Hotline
Ombudsman's Hotline 800-368-5888
www.epa.gov/sbo

U.S. EPA Small Business Compliance Assistance Centers
es.epa.gov/oeca/main/compasst/

U.S. Government Printing Office
Superintendent of Documents
100 West Bay Street, Suite 100
Jacksonville, FL 32202
904-353-0569 www.access.gpo.gov/su_docs
Copy of Federal Requirements (Codes of Federal Regulations) www.access.gpo.gov/nara/cfr

Waste Exchange
The Southern Waste Information Exchange (SWIX)
P.O. Box 960
Tallahassee, FL 32302
800-441-SWIX (7949) swix@mailer.fsu.edu
www.wastexchange.org

Acronym Glossary

CESQG	Conditionally Exempt Small Quantity Generator
DEP	Florida Department of Environmental Protection
EPA	Environmental Protection Agency
FAC	Florida Administrative Code
MSDS	Material Safety Data Sheet
PCW	Petroleum Contact Water
RCRA	Resource Conservation and Recovery Act
SQG	Small Quantity Generator
SWIX	Southern Waste Information Exchange
CFR	Code of Federal Regulations
UN/NA	United Nations/North American identification system

Definitions Glossary

Acute Waste: very toxic waste which can be fatal to humans in small amounts. (Refer to 40 CFR Part 261.31-261.32, Hazardous Waste Lists, Acute Wastes.)

Aquiter: a geologic formation, group of formations, or part of a formation capable of yielding a significant amount of ground water to wells or springs.

Container: any portable device in which a material is stored, transported, treated, disposed of or otherwise handled.

Contingency Plan: a document setting out an organized, planned, coordinated course of action to be followed in case of fire, explosion, or release of a hazardous waste or its constituents which could threaten human health or the environment.

Disposal: the discharge, deposit, injection, dumping, spilling, leaking, or placing of any solid or hazardous waste into or on any land or water so that such solid or hazardous waste or any constituent thereof may enter the environment or be emitted into the air or discharged into any waters, including ground waters.

EPA Hazardous Waste Number: the number assigned by EPA to each hazardous waste listed in 40 CFR Part 261, Subpart D and to each characteristic identified in 40 CFR Part 261, Subpart C.

EPA Identification Number: the number assigned by the EPA to each generator, transporter, and treatment, storage, or disposal facility.

Freeboard: the vertical distance between the top of a tank or surface impoundment dike, and the surface of the waste contained therein.

Generator: any person, by site, whose act or process produces hazardous waste identified or listed in 40 CFR Part 261 or whose act first causes a hazardous waste to become subject to regulation.

Hazardous Waste: hazardous waste as defined in 40 CFR Part 261.

Incompatible Waste: a hazardous waste which is unsuitable for:

- placement in a particular device or facility because it may cause corrosion or decay of containment materials (e.g., container inner liners or tank walls) or
- commingling with another waste or material under uncontrolled conditions because the commingling might produce heat or pressure, fire or explosion, violent reaction, toxic dusts, mists, fumes or gases, or flammable fumes or gases. (See 40 CFR Part 264, Appendix V for examples.)

Manifest: the shipping document EPA form 8700-22 and, if necessary, EPA form 8700-22A, originated and signed by the generator in accordance with instructions included in the Appendix to 40 CFR Part 262.

Manifest document number: the U.S. EPA 12-digit identification number assigned to the generator plus a unique 5-digit document number assigned to the Manifest by the generator for recording and reporting.

Small Quantity Generator: one who generates less than 1,000 kg of hazardous waste in a calendar month.

Transporter: a person engaged in offsite transportation of hazardous waste by air, rail, highway, or water.

Used Oil: any oil that has been refined from crude oil, or any synthetic oil, that has been used and as a result of such use is contaminated by physical or chemical impurities.

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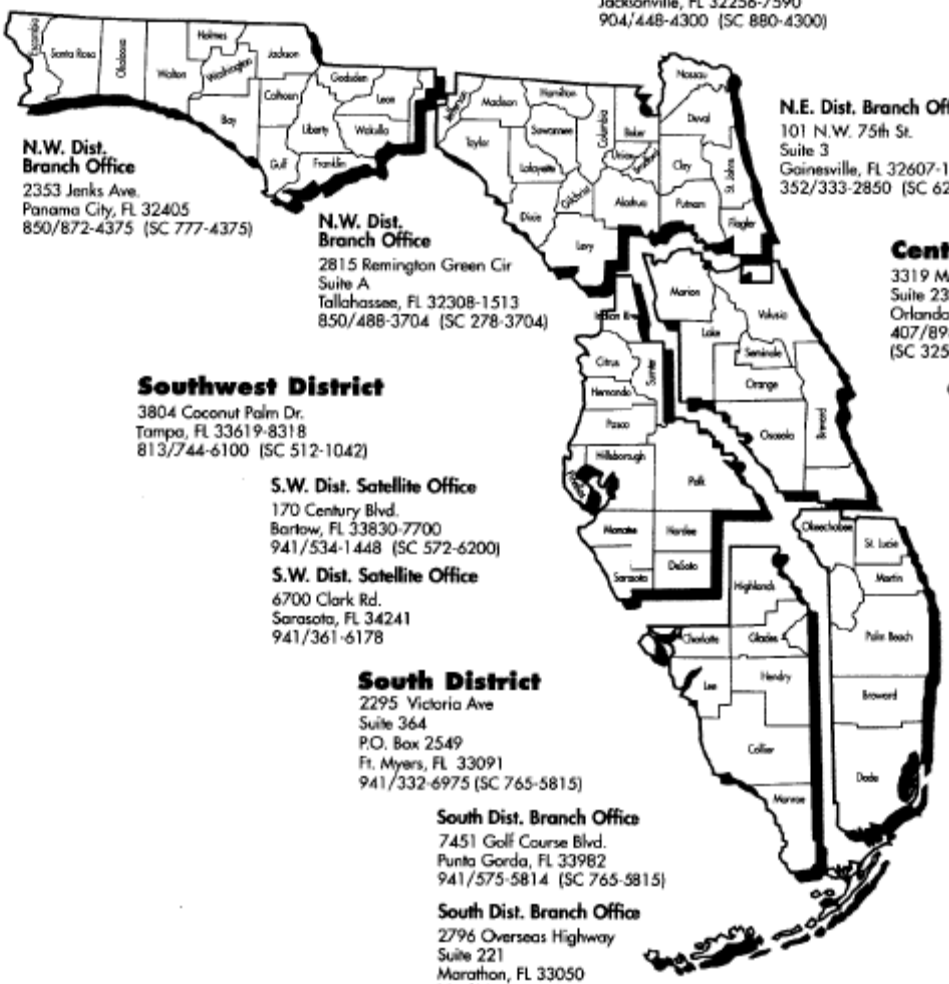
Northeast District
7825 Baymeadows Way
Suite B200
Jacksonville, FL 32256-7590
904/448-4300 (SC 880-4300)



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2815 Remington Green Cir
Suite A
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850/488-3704 (SC 278-3704)

N.E. Dist. Branch Office
101 N.W. 75th St.
Suite 3
Gainesville, FL 32607-1609
352/333-2850 (SC 627-2850)

Central District
3319 Maguire Blvd.
Suite 232
Orlando, FL 32803-3767
407/894-7555
(SC 325-2290)

Central Dist. Branch Office
13 East Melbourne Ave.
Melbourne, FL 32901
407/984-4800
(SC 350-4800)

Southwest District
3804 Coconut Palm Dr.
Tampa, FL 33619-8318
813/744-6100 (SC 512-1042)

S.W. Dist. Satellite Office
170 Century Blvd.
Bartow, FL 33830-7700
941/534-1448 (SC 572-6200)

S.W. Dist. Satellite Office
6700 Clark Rd.
Sarasota, FL 34241
941/361-6178

Southeast District
400 N. Congress Ave.
P.O. Box 15425
West Palm Beach, FL 33416
561/681-6600
(SC 226-6600)

S.E. Dist. Branch Office
1801 S.E. Hillmoor Dr.
Suite C-204
Port St. Lucie, FL 34952
561/871-7662
(SC 222-7662)

South District
2295 Victoria Ave
Suite 364
P.O. Box 2549
Ft. Myers, FL 33091
941/332-6975 (SC 765-5815)

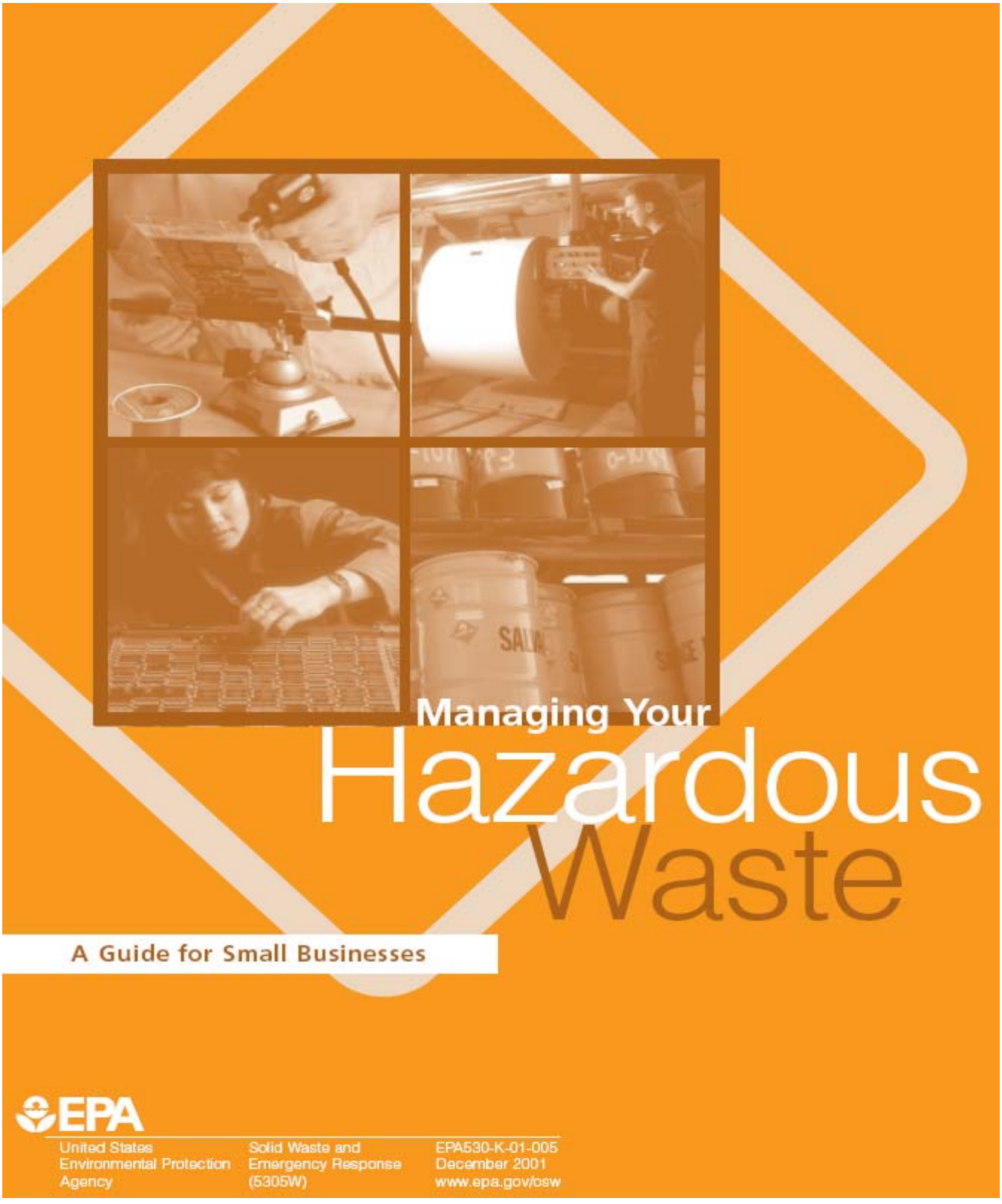
South Dist. Branch Office
7451 Golf Course Blvd.
Punta Gorda, FL 33982
941/575-5814 (SC 765-5815)

South Dist. Branch Office
2796 Overseas Highway
Suite 221
Marathon, FL 33050
305/289-2310 (SC 464-2310)

David B. Struhs, Secretary
Florida Department of Environmental Protection

Division of Waste Management
Twin Towers Office Building 2600 Blair Stone Road
Tallahassee, Florida 32399-2400
850-487-3299 **www.dep.state.fl.us**

Appendix O **MANAGING YOUR HAZARDOUS WASTE (A Guide for Small Businesses)**



CONTENTS

INTRODUCTION

Does your business generate hazardous waste? Many small businesses do. If you need help understanding which federal hazardous waste management regulations apply to your business, this handbook is for you. It has been prepared by the U.S. Environmental Protection Agency (EPA) to help small-business owners and operators understand how best to comply with federal hazardous waste management regulations.

This handbook provides an overview of the regulations to give you a basic understanding of your responsibilities. It should not be used as a substitute for the actual requirements. All of the federal hazardous waste regulations are located in Title 40 of the Code of Federal Regulations (CFR), Parts 260 to 299 (www.epa.gov/epacfr40).

EPA defines three categories of hazardous waste generators based upon the quantity of hazardous waste they generate per month:

(1) Conditionally exempt small quantity generators (CESQGs), which generate less than 220 lbs (100 kg) per month.

(2) Small quantity generators (SQGs), which generate between 220 lbs (100 kg) and 2,200 lbs (1,000 kg) per month.

(3) Large quantity generators (LQGs), which generate more than 2,200 lbs (1,000 kg) per month.

Each category of generator must comply with the hazardous waste rules specific to that category. This handbook is intended primarily for businesses that generate a small quantity of hazardous waste (SQGs and CESQGs) to help them learn about regulations that apply to them.

This handbook explains only the *federal* requirements for hazardous waste management. Many states have their own hazardous waste regulations based on the federal hazardous waste regulations. In some of these states, the requirements are the same as the federal standards and definitions. Other states, however, have developed more stringent requirements than the federal program. If this is the case in your state, you must comply with the state regulations. To become familiar with your state's requirements, consult your state hazardous waste agency. For the address or phone number for your state agency, contact the RCRA Call Center at 800 424-9346 or TDD 800 553-7672.

TIP

You can look up unfamiliar words, phrases, or acronyms in the list of definitions found on page 26.

FOR MORE INFORMATION

If you have questions about any part of this book, or the federal hazardous waste regulations, contact the RCRA Call Center at 703 412-9810 or TDD 703 412-3323 in the Washington, DC, area or at 800 424-9346 or TDD 800 533-7672 from other locations, or <www.epa.gov/epaoswer/hotline>.

The Call Center provides free technical assistance. Any information you share will not be used for any other purpose.

DECIDING WHETHER HAZARDOUS WASTE REGULATIONS APPLY TO YOU

Federal hazardous waste management regulations apply to most businesses that generate hazardous waste. To determine if these regulations apply to your business, you must first determine if you even generate hazardous waste.

Defining Hazardous Waste

A waste is any solid, liquid, or contained gaseous material that is discarded by being disposed of, burned or incinerated, or recycled. (There are some exceptions for recycled materials.) It can be the by-product of a manufacturing process or simply a commercial product that you use in your business—such as a cleaning fluid or battery acid—and that is being disposed of. Even materials that are recyclable or can be reused in some way (such as burning solvents for fuel) might be considered waste.

Hazardous waste can be one of two types:

- **Listed waste.** Your waste is considered hazardous if it appears on one of four lists published in the Code of Federal Regulations (40 CFR Part 261). Currently, more than 500 wastes are listed. Wastes are listed as hazardous because they are known to be harmful to human health and the environment when not managed properly.

  Even when managed properly, some listed wastes are so dangerous that they are called acutely hazardous wastes. Examples of acutely hazardous wastes include wastes generated from some pesticides and that can be fatal to humans even in low doses.

- **Characteristic wastes.** If your waste does not appear on one of the hazardous waste lists, it still might be considered hazardous if it demonstrates one or more of the following characteristics:

  - It catches fire under certain conditions. This is known as an ignitable waste. Examples are paints and certain degreasers and solvents.
  - It corrodes metals or has a very high or low pH. This is known as a corrosive waste. Examples are rust removers, acid or alkaline cleaning fluids, and battery acid.
  - It is unstable and explodes or produces toxic fumes, gases, and vapors when mixed with water or under other conditions such as heat or pressure. This is known as a reactive waste. Examples are certain cyanides or sulfide-bearing wastes.
  - It is harmful or fatal when ingested or absorbed, or it leaches toxic chemicals into the soil or ground water when disposed of on land. This is known as a toxic waste. Examples are wastes that contain high concentrations of heavy metals, such as cadmium, lead, or mercury.

  You can determine if your waste is toxic by having it tested using the Toxicity Characteristic Leaching

- Determine if you generate hazardous waste in the first place.
- Measure the amount of hazardous waste that you produce per month.
- Determine your generator category to learn the management requirements that apply to you.

TIP

One way to help determine if your waste exhibits any of the characteristics listed on page 2 is to check the Material Safety Data Sheet (MSDS) that comes with all products containing hazardous materials (www.msdsonline.com for information). In addition, your national trade association or its local chapter might be able to help you.

Procedure (TCLP), or by simply knowing that your waste is hazardous or that your processes generate hazardous waste. For more information about the TCLP and other test methods, contact the RCRA Call Center or the Methods Information Communication Exchange (MICE) at 703 676-4690 or <www.epa.gov/sw-846>.

Identifying Your Waste

To help you identify some of the waste streams common to your business, consult the table on page 4 to find a list of typical hazardous wastes generated by small businesses. Use the insert in the middle of this handbook for a more detailed listing of the EPA waste codes associated with these waste streams to determine if your waste is hazardous. Commercial chemical products that are discarded might also become hazardous waste. For a complete listing of hazardous waste codes, see 40 CFR Part 261.

If your waste is hazardous, you will need to manage it according to appropriate federal regulations.

Finding Your Generator Category

Once you know that you generate hazardous waste, you need to measure the amount of waste you produce per month. The amount of hazardous waste you generate determines your generator category.

Many hazardous wastes are liquids and are measured in gallons—not pounds. In order to measure your liquid wastes, you will need to convert from gallons to pounds. To do this, you must know the density of the liquid. A rough guide is that 30 gallons (about half of a 55-gallon drum) of waste with a density similar to water weighs about 220 pounds (100 kg); 300 gallons of a waste with a density similar to water weighs about 2,200 lbs (1,000 kg).

EPA has established three generator categories, as follows, each of which is regulated differently:

CESQGs:
Conditionally Exempt Small Quantity Generators: You are considered a CESQG if you generate less than 220 lbs (100 kg) per month of hazardous waste. You are exempt from hazardous waste management regulations provided that you comply with the basic requirements described on page 6.

If you are a CESQG and you generate no more than 2.2 lbs (1 kg) of **acutely hazardous waste** (or 220 lbs (100 kg) of acutely hazardous waste spill residues) in a calendar month, and never store more than that amount for any period of time, you may manage the acutely hazardous waste according to the CESQG requirements. If you generate or store more than 2.2 lbs (1kg) of acutely hazardous waste on site, you must manage it according to the LQG requirements (see below).

SQGs:
Small Quantity Generators: You are considered an SQG if you generate between 220 and 2,200 lbs (100 and 1,000 kg) per month of hazardous waste. SQGs must comply with EPA requirements for managing hazardous waste described in this document.

LQGs:
Large Quantity Generators: You are considered an LQG if you generate more than 2,200 lbs (1,000 kg) per month of hazardous waste. LQGs must comply with more extensive hazardous waste rules than those summarized in this handbook. See page 21 for an overview.

TYPICAL HAZARDOUS WASTE GENERATED BY SMALL BUSINESSES

TYPE OF BUSINESS	HOW GENERATED	TYPICAL WASTES	WASTE CODES
Drycleaning and Laundry Plants	Commercial drycleaning processes	Still residues from solvent distillation, spent filter cartridges, cooked powder residue, spent solvents, unused perchloroethylene	D001, D039, F002, F005, U210
Furniture/Wood Manufacturing and Refinishing	Wood cleaning and wax removal, refinishing/stripping, staining, painting, finishing, brush cleaning and spray brush cleaning	Ignitable wastes, toxic wastes, solvent wastes, paint wastes	D001, F001-F005
Construction	Paint preparation and painting, carpentry and floor work, other specialty contracting activities, heavy construction, wrecking and demolition, vehicle and equipment maintenance for construction activities	Ignitable wastes, toxic wastes, solvent wastes, paint wastes, used oil, acids/bases	D001, D002, F001-F005
Laboratories	Diagnostic and other laboratory testing	Spent solvents, unused reagents, reaction products, testing samples, contaminated materials	D001, D002, D003, F001-F005, U211
Vehicle Maintenance	Degreasing, rust removal, paint preparation, spray booth, spray guns, brush cleaning, paint removal, tank cleanout, installing lead-acid batteries, oil and fluid replacement	Acids/bases, solvents, ignitable wastes, toxic wastes, paint wastes, batteries, used oil, unused cleaning chemicals	D001, D002, D006, D007, D008, D035, F001-F005, U002, U080, U134, U154, U159, U161, U220, U228, U239
Printing and Allied Industries	Plate preparation, stencil preparation for screen printing, photoprocessing, printing, cleanup	Acids/bases, heavy metal wastes, solvents, toxic wastes, ink, unused chemicals	D002, D006, D008, D011, D019, D035, D039, D040, D043, F001-F005, U002, U019, U043, U055, U056, U069, U080, U112, U122, U154, U159, U161, U210, U211, U220, U223, U226, U228, U239, U259, U359
Equipment Repair	Degreasing, equipment cleaning, rust removal, paint preparation, painting, paint removal, spray booth, spray guns, and brush cleaning.	Acids/bases, toxic wastes, ignitable wastes, paint wastes, solvents	D001, D002, D006, D008, F001-F005
Pesticide End-Users/Application Services	Pesticide application and cleanup	Used/unused pesticides, solvent wastes, ignitable wastes, contaminated soil (from spills), contaminated rinsewater, empty containers	D001, F001-F005, U129, U136, P094, P123
Educational and Vocational Shops	Automobile engine and body repair, metalworking, graphic arts-plate preparation, woodworking	Ignitable wastes, solvent wastes, acids/bases, paint wastes	D001, D002, F001-F005
Photo Processing	Processing and developing negatives/prints, stabilization system cleaning	Acid regenerants, cleaners, ignitable wastes, silver	D001, D002, D007, D011
Leather Manufacturing	Hair removal, bating, soaking, tanning, buffing, and dyeing	Acids/bases, ignitables wastes, toxic wastes, solvent wastes, unused chemicals	D001, D002, D003, D007, D035, F001-F005, U159, U228, U220

TIP

In many cases, small businesses that fall into different generator categories at different times choose to satisfy the more stringent requirements to simplify compliance.

UNIVERSAL WASTES

The Universal Waste Rule was written to streamline environmental regulations for wastes generated by large numbers of businesses in relatively small quantities. It is designed to reduce the amount of hazardous waste disposed of in municipal solid waste, encourage the recycling and proper disposal of certain common hazardous wastes, and reduce the regulatory burden for businesses that generate these wastes.

Universal wastes are items commonly thrown into the trash by households and small businesses. Although handlers of universal wastes can meet less stringent standards for storing, transporting, and collecting these wastes, handlers must still comply with the full hazardous waste requirements for final recycling, treatment, or disposal. By providing a waste management structure that removes these wastes from municipal landfills and incinerators, this rule ensures stronger safeguards for public health and the environment.

Universal wastes include:

- Batteries, such as nickel-cadmium (Ni-Cd) and small sealed lead-acid batteries, which are found in many common items, including electronic equipment, cell phones, portable computers, and emergency backup lighting.
- Agricultural pesticides that have been recalled or banned from use, are obsolete, have become damaged, or are no longer needed due to changes in cropping patterns or other factors. They often are stored for long periods of time in sheds or barns.
- Thermostats, which can contain as much as 3 grams of liquid mercury and are located in almost any building, including commercial, industrial, agricultural, community, and household buildings.
- Lamps, which typically contain mercury and sometimes lead, and are found in businesses and households. Examples include fluorescent, high-intensity discharge (HID), neon, mercury vapor, high-pressure sodium, and metal halide lamps.

Materials are continually added to the Universal Waste list; check <www.epa.gov/epaoswer/hazwaste/id/univwast.htm> for the latest information.

The Universal Waste Rule also encourages communities and businesses to establish collection programs or participate in manufacturer take-back programs required by a number of states. Many large manufacturers and trade associations are already planning national and regional collection programs for their universal waste products.

For more information, see 40 CFR Part 273.

WHAT IS YOUR GENERATOR CATEGORY?

Depending on your type of business, you might be regulated under different rules at different times. If, for example, you generate less than 220 lbs (100 kg) of hazardous waste during the month of June, you would be considered a CESQG for June, and your June waste would be subject to the hazardous waste management requirements for CESQGs. If, in July, you generate between 220 and 2,200 lbs (100 kg to 1,000 kg) of hazardous waste, your generator status would change, and you would be considered an SQG for July. Your July waste would then be subject to the management requirements for SQGs. If you mix the wastes generated during June and July, the entire mixture would be subject to the more stringent SQG standards.

WHAT DO YOU MEASURE TO DETERMINE YOUR GENERATOR CATEGORY?

DO Measure:

All quantities of listed and characteristic hazardous wastes that are:

- Accumulated on the property for any period of time before disposal or recycling. (Drycleaners, for example, must count any residue removed from machines, as well as spent cartridge filters.)
- Packaged and transported away from your business.
- Placed directly in a regulated treatment or disposal unit at your place of business.
- Generated as still bottoms or sludges and removed from product storage tanks.

DO NOT Measure:

Wastes that:

- Are specifically exempted from counting. Examples include lead-acid batteries that will be reclaimed, scrap metal that will be recycled, used oil managed under the used oil provisions of 40 CFR 279, and universal wastes (e.g., batteries, pesticides, thermostats, and lamps) managed under 40 CFR 273.
- Might be left in the bottom of containers that have been thoroughly emptied through conventional means such as pouring or pumping.
- Are left as residue in the bottom of tanks storing products, if the residue is not removed from the product tank.
- Are reclaimed continuously on site without storing prior to reclamation, such as drycleaning solvents.
- Are managed in an "elementary neutralization unit," a "totally enclosed treatment unit," or a "wastewater treatment unit," without being stored first. (See Definitions for an explanation of these types of units.)
- Are discharged directly to publicly owned treatment works (POTWs) without being stored or accumulated first. This discharge to a POTW must comply with the Clean Water Act. POTWs are public utilities, usually owned by the city, county, or state, that treat industrial and domestic sewage for disposal.
- Have already been counted once during the calendar month, and are treated on site or reclaimed in some manner, and used again.
- Are regulated under the universal waste rule or have other special requirements. The federal regulations contain special, limited requirements for managing certain commonly generated wastes. These wastes can be managed following the less burdensome requirements listed below instead of the usual hazardous waste requirements. Check with your state agency to determine if your state has similar regulations.

Used oil—40 CFR Part 279

Lead-acid batteries that are reclaimed—40 CFR Part 266, Subpart G

Scrap metal that is recycled—40 CFR 261.6 (a)(3)

Universal wastes (e.g., certain batteries, recalled and collected pesticides, and mercury-containing thermostats and lamps)—40 CFR Part 273

CESQG

OVERVIEW OF REQUIREMENTS FOR CONDITIONALLY EXEMPT SMALL QUANTITY GENERATORS

If you generate no more than 220 lbs (100 kg) of hazardous waste per month, you are a Conditionally Exempt Small Quantity Generator (CESQG). You must comply with three basic waste management requirements to remain exempt from the full hazardous waste regulations that apply to generators of larger quantities (SQGs and LQGs).

(Note: there are different quantity limits for acutely hazardous waste.)

First, you must identify all hazardous waste that you generate. Second, you may not store more than 2,200 lbs (1,000 kg) of hazardous waste on site at any time. Finally, you must ensure delivery of your hazardous waste to an off-site treatment or disposal facility that is one of the following, or, if you treat or dispose of your hazardous waste on site, your facility also most be:

- A state or federally regulated hazardous waste management treatment, storage, or disposal facility.
- A facility permitted, licensed, or registered by a state to manage municipal or industrial solid waste.
- A facility that uses, reuses, or legitimately recycles the waste (or treats the waste prior to use, reuse, or recycling).
- A universal waste handler or destination facility subject to the universal waste requirements of 40 CFR Part 273. (Universal wastes are wastes such as certain batteries, recalled and collected pesticides, or mercury-containing thermostats or lamps.)

STATE REQUIREMENTS

Some states have additional requirements for CESQGs. For example, some states require CESQGs to follow some of the SQG requirements such as obtaining an EPA identification number, or complying with storage standards. See page 14 for SQG storage requirements.

Suggestion:

It's a good idea to call the appropriate state agency to verify that the treatment, storage, and disposal facility (TSDF) you have selected has any necessary permits, etc. You also may want to see that the facility fits into one of the above categories. (It's a good idea to document such calls for your records.)

- Identify your hazardous waste.
- Comply with storage quantity limits.
- Ensure proper treatment and disposal of your waste.

SQG

OBTAINING AN EPA IDENTIFICATION NUMBER

If your business generates between 220 lbs (100 kg) and 2,200 lbs (1,000 kg) of hazardous waste per month, you are an SQG, and you must obtain and use an EPA identification number. EPA and states use these 12-character numbers to monitor and track hazardous waste activities. You will need to use your identification number when you send waste off site to be managed.

To obtain an EPA identification number, you should:

- Call or write your state hazardous waste management agency or the hazardous waste division of your EPA Regional office and ask for a copy of EPA Form 8700-12, "Notification of Hazardous Waste Activity" (EPA Regional offices are listed on pages 24 or visit <www.epa.gov/epaoswer/hazwaste/data/form8700/forms.htm>). You will be sent a booklet that contains a form with instructions and those portions of the regulations that will help you identify your waste. A sample copy of a completed notification form is shown on pages 9-10. (Note: A few states use a form that is different from the one shown. Your state agency will send you the appropriate form to complete.)
- Fill in the form as shown in the example. To complete Item IX of the form, you will need to identify your hazardous waste by its EPA Hazardous Waste Code. A list of common hazardous wastes and their waste codes can be found on the insert in this handbook; for a complete list of waste codes, you should consult 40 CFR Part 261, or contact your state or regional EPA office or the RCRA Call Center. The form you receive from your state might contain an additional sheet that provides more space for waste codes. Complete one copy of the form for each business site where you generate or handle hazardous waste. Each site will receive its own EPA identification number. Make sure you sign the certification in Item X.
- Send the completed form to your state hazardous waste contact. This address is listed in the information booklet that you will receive with the form.

EPA records the information on the form and assigns an EPA identification number to the site identified on your form. The EPA number stays with the property when ownership changes. If you move your business, you must notify EPA or the state of your new location and submit a new form. If another business previously handled hazardous waste at this location and obtained an EPA Identification Number, you will be assigned the same number after you have notified EPA that you have moved to this location. Otherwise, EPA will assign you a new identification number.

- Call your state agency to determine if you need an EPA identification number.
- If you do, obtain a copy of EPA Form 8700-12.
- Fill in the form completely.
- Send the form to your STATE hazardous waste contact.

SQG

SAMPLE "NOTIFICATION OF REGULATED WASTE ACTIVITY" FORM

Please print or type with ELITE type (12 characters per inch) in the unshaded areas only

GSA No. 8546-EPA-OT

Please refer to Section V, Line-by-Line Instructions for Completing EPA Form 8700-12 before completing this form. The information requested here is required by law (Section 3010 of the Resource Conservation and Recovery Act).

Notification of Regulated Waste Activity

EPA United States Environmental Protection Agency

Date Received (For Official Use Only)

I. Installation's EPA ID Number (Mark 'X' in the appropriate box)

☑ A. Initial Notification ☐ B. Subsequent Notification (Complete item C)

C. Installation's EPA ID Number

II. Name of Installation (Include company and specific site name)

General Metal Processing Co

III. Location of Installation (Physical address not P.O. Box or Route Number)

Street: 501 Main Street

Street (Continued):

City or Town: Smalltown | State: VA | Zip Code: 23000-

County Code: | County Name:

IV. Installation Mailing Address (See instructions)

Street or P.O. Box: 501 Main Street

City or Town: Smalltown | State: VA | Zip Code: 23000-

V. Installation Contact (Person to be contacted regarding waste activities at site)

Name (Last): Jones | (First): William

Job Title: Manager | Phone Number (Area Code and Number): 804-555-1234

VI. Installation Contact Address (See instructions)

A. Contact Address Location ☑ Mailing ☐ | B. Street or P.O. Box: 501 Main Street

City or Town: Smalltown | State: VA | Zip Code: 23000-

VII. Ownership (See instructions)

A. Name of Installation's Legal Owner: Josephine Doe

Street, P.O. Box, or Route Number: 234 Broad Street

City or Town: Smalltown | State: VA | Zip Code: 23000-

Phone Number (Area Code and Number): 804-555-6789 | B. Land Type | C. Owner Type | D. Change of Owner Indicator: Yes ☐ No ☑ | Date Changed: Month Day Year

EPA Form 8700-12 (Rev. 12/99) - 1 of 2 -

SQG

SAMPLE "NOTIFICATION OF REGULATED WASTE ACTIVITY" FORM (CONTINUED)

Please print or type with ELITE type (12 characters per inch) in the unshaded areas only

Form Approved, OMB No. 2050-0028 Expires 12/31/02
OSA No. 8246-EPA-OT

ID - For Official Use Only

VIII. Type of Regulated Waste Activity *(Mark 'X' in the appropriate boxes. Refer to instructions)*

A. Hazardous Waste Activities

1. Generator (See Instructions)
   - ☐ a. Greater than 1000kg/mo (2,200 lbs.)
   - ☒ b. 100 to 1000 kg/mo (220-2,200 lbs.)
   - ☐ c. Less than 100 kg/mo (220 lbs)
2. Transporter (Indicate Mode in boxes 1-5 below)
   - ☐ a. For own waste only
   - ☐ b. For commercial purposes

Mode of Transportation
- ☐ 1. Air
- ☐ 2. Rail
- ☐ 3. Highway
- ☐ 4. Water
- ☐ 5. Other - specify

☐ 3. Treater, Storer, Disposer (at installation) Note: A permit is required for this activity, see instructions.

4. Exempt Boiler and/or Industrial Furnace
   - ☐ a. Smelting, Melting, and Refining Furnace Exemption
   - ☐ b. Small Quantity On-Site Burner Exemption

☐ 5. Underground Injection Control

B. Universal Waste Activity

☐ Large Quantity Handler of Universal Waste

C. Used Oil Management Activities

1. Used Oil Transporter/Transfer Facility - Indicate Type(s) of Activity(ies)
   - ☐ a. Transporter
   - ☐ b. Transfer Facility
2. Used Oil Processor/Re-refiner - Indicate Type(s) of Activity(ies)
   - ☐ a. Processor
   - ☐ b. Re-refiner
3. ☐ Off-Specification Used Oil Burner
4. Used Oil Fuel Marketer
   - ☐ a. Marketer Who Directs Shipment of Off-Specification Used Oil to Used Oil Burner
   - ☐ b. Marketer Who First Claims the Used Oil Meets the Specifications

IX. Description of Hazardous Wastes *(Use additional sheets if necessary)*

A. Listed Hazardous Wastes. *(See 40 CFR 261.31 - 33; See instructions if you need to list more than 12 waste codes.)*

1	2	3	4	5	6
F008	F011	K009			
7	**8**	**9**	**10**	**11**	**12**

B. Characteristics of Nonlisted Hazardous Wastes. *(Mark 'X' in the boxes corresponding to the characteristics of nonlisted hazardous wastes your installation handles; See 40 CFR Parts 261.20 - 261.24; See instructions if you need to list more than 4 toxicity characteristic waste codes.)*

1. Ignitable (D001)	2. Corrosive (D002)	3. Reactive (D003)	4. Toxicity Characteristic	(List specific EPA hazardous waste number(s) for the Toxicity Characteristic contaminant(s)) 1	2	3	4
X							

C. Other Wastes. *(State-regulated or other wastes requiring a handler to have an I.D. number; See instructions.)*

1	2	3	4	5	6

X. Certification

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Signature	Name and Official Title *(Type or print)*	Date Signed
Josephine Doe	Josephine Doe, owner	12-01-00

XI. Comments

Note: Mail completed form to the appropriate EPA Regional or State Office. *(See Section IV of the booklet for addresses.)*

EPA Form 8700-12 (Rev. 12/99) - 2 of 2 -

TIP

It is a good practice never to mix wastes. Mixing wastes can create an unsafe work environment and lead to complex and expensive cleanups and disposal.

SQG

MANAGING HAZARDOUS WASTE ON SITE

Most small businesses accumulate some hazardous waste on site for a short period of time and then ship it off site to a treatment, storage, or disposal facility (TSDF).

Accumulating Your Waste

Accumulating hazardous waste on site can pose a threat to human health and the environment, so you may keep it only for a short time without a permit. Before shipping the waste for disposal or recycling, you are responsible for its safe management, which includes safe storage, safe treatment, preventing accidents, and responding to emergencies in accordance with federal regulations.

SQGs can accumulate no more than 13,228 lbs (6,000 kg) of hazardous waste on site for up to 180 days without a permit. You can accumulate this amount of waste for up to 270 days if you must transport it more than 200 miles away for recovery, treatment, or disposal. Limited extensions may be granted by the state director or the regional EPA administrator. If you exceed these limits, you are considered a TSDF and must obtain an operating permit. Wastes generated in small amounts throughout your facility may be stored in satellite accumulation areas located at or near the point of generation of the waste. The total amount of waste that may be accumulated at a satellite area is limited to 55 gallons. Once this quantity has been exceeded, you have 3 days to transfer the waste to your designated 180-day (or 270-day) storage area.

(Note: Different quantity limits apply to acutely hazardous wastes.)

SQGs must accumulate waste in tanks or containers, such as 55-gallon drums. Your storage tanks and containers must be managed according to EPA requirements summarized below:

For containers, you must:

- Label each container with the words "HAZARDOUS WASTE" and the date that the waste was generated.
- Use a container made of, or lined with, a material that is compatible with the hazardous waste to be stored. (This will prevent the waste from reacting with or corroding the container.)
- Keep all containers holding hazardous waste closed during storage, except when adding or removing waste. Do not open, handle, or store (e.g., stack) containers in a way that might rupture them, cause them to leak, or otherwise fail.
- Inspect areas where containers are stored at least weekly. Look for leaks and for deterioration caused by corrosion or other factors.
- Maintain the containers in good condition. If a container leaks, put the hazardous waste in another container, or contain it in some other way that complies with EPA regulations.
- Do not mix incompatible wastes or materials unless precautions are taken to prevent certain hazards.

- Accumulate wastes according to limits established by EPA for SQGs.
- Follow the storage and handling procedures required by EPA for SQGs.
- Follow EPA requirements for equipment testing and maintenance, access to communications or alarms, aisle space, and emergency arrangements with local authorities.

SQG

WASTE MINIMIZATION: THE KEY TO BETTER WASTE MANAGEMENT

The easiest and most cost-effective way of managing any waste is not to generate it in the first place. You can decrease the amount of hazardous waste your business produces by developing a few "good housekeeping" habits. Good housekeeping procedures generally save businesses money, and they prevent accidents and waste. To help reduce the amount of waste you generate, try the following practices at your business.

- **Do not mix wastes.** Do not mix nonhazardous waste with hazardous waste. Once you mix anything with listed hazardous waste, the whole batch becomes hazardous. Mixing waste can also make recycling very difficult, if not impossible. A typical example of mixing wastes would be putting nonhazardous cleaning agents in a container of used hazardous solvents.
- **Change materials, processes, or both.** Businesses can save money and increase efficiency by replacing a material or a process with another that produces less waste. For example, you could use plastic blast media for paint stripping of metal parts rather than conventional solvent stripping.
- **Recycle and reuse manufacturing materials.** Many companies routinely put useful components back into productive use rather than disposing of them. Items such as oil, solvents, acids, and metals are commonly recycled and used again. In addition, some companies have taken waste minimization actions such as using fewer solvents to do the same job, using solvents that are less toxic, or switching to a detergent solution.
- **Safely store hazardous products and containers.** You can avoid creating more hazardous waste by preventing spills or leaks. Store hazardous product and waste containers in secure areas, and inspect them frequently for leaks. When leaks or spills occur, materials used to clean them also become hazardous waste.
- **Make a good faith effort.** SQGs do not have to document their waste minimization activities or create a waste minimization plan. You do, however, need to certify on your manifests that you have made a good faith effort to minimize waste generation when you send your waste off site.

SQG

For tanks, you must:

- Label each tank with the words "HAZARDOUS WASTE" and the date that the waste was generated.
- Store only waste that will not cause the tank or the inner liner of the tank to rupture, leak, corrode, or fail.
- Equip tanks that have an automatic waste feed with a waste feed cutoff system, or a bypass system for use in the event of a leak or overflow.
- Inspect discharge control and monitoring equipment and the level of waste in uncovered tanks at least once each operating day. Inspect the tanks and surrounding areas for leaks or other problems (such as corrosion) at least weekly.
- Use the National Fire Protection Association's (NFPA's) buffer zone requirements for covered tanks containing ignitable or reactive wastes. These requirements specify distances considered to be safe buffer zones for various ignitable or reactive wastes. You can reach the NFPA at 617 770-3000.
- Do not mix incompatible wastes or materials unless precautions are taken to prevent certain hazards.
- Do not place ignitable or reactive wastes in tanks unless certain precautions are taken.
- Provide at least 2 feet (60 centimeters) of freeboard (space at the top of each tank) in uncovered tanks, unless the tank is equipped with a containment structure, a drainage control system, or a standby tank with adequate capacity.

Treating Your Waste to Meet the Land Disposal Restrictions (LDRs)

Most hazardous wastes may not be land disposed unless they meet "treatment standards." The Land Disposal Restrictions (LDR) program requires that the waste is treated to reduce the hazardous constituents to levels set by EPA, or that the waste is treated using a specific technology. It is your responsibility to ensure that your waste is treated to meet LDR treatment standards before it is land disposed. (See page 17 for a description of required LDR notices.) Most SQGs probably will have their designated TSDF do this treatment. If you choose to treat your waste yourself to meet LDR treatment standards, there are additional requirements including waste analysis plans, notifications, and certifications. To learn about these requirements, contact the RCRA Call Center, your state agency, or EPA regional office, and consult 40 CFR Part 268.

Preventing Accidents

Whenever you store hazardous waste on site, you must minimize the potential risks from fires, explosions, or other accidents.

SQG

All SQGs that store hazardous waste on site must be equipped with:

- An internal communications or alarm system capable of providing immediate emergency instruction (voice or signal) to all personnel.
- A device, such as a telephone (immediately available at the scene of operations) or a hand-held, two-way radio, capable of summoning emergency assistance from local police and fire departments or emergency response teams.
- Portable fire extinguishers, fire-control devices (including special extinguishing equipment, such as those using foam, inert gas, or dry chemicals), spill-control materials, and decontamination supplies.
- Water at adequate volume and pressure to supply water-hose streams, foam-producing equipment, automatic sprinklers, or water spray systems.

You must test and maintain all equipment to ensure proper operation. Allow sufficient aisle space to permit the unobstructed movement of personnel, fire protection equipment, spill-control equipment, and decontamination equipment to any area of facility operation. Attempt to secure arrangements with fire departments, police, emergency response teams, equipment suppliers, and local hospitals, as appropriate, to provide services in the event of an emergency. Ensure that personnel handling hazardous waste have immediate access to an alarm or emergency communications device.

You are not required to have a formal personnel training program, but you must ensure that employees handling hazardous waste are familiar with proper handling and emergency procedures. In addition, you must have an emergency coordinator on the premises or on-call at all times, and have basic facility safety information readily accessible.

IF YOU THINK YOU HAVE AN EMERGENCY, IMMEDIATELY CALL 911 AND THE NATIONAL RESPONSE CENTER AT 800 424-8802.

In the event of a fire, explosion, or other release of hazardous waste that could threaten human health outside the facility, or if you think that a spill has reached surface water, call the National Response Center to report the emergency. The Response Center will evaluate the situation and help you make appropriate emergency decisions. In many cases, you will find that the problem you faced was not a true emergency, but **it is better to call if you are not sure.** Serious penalties exist for failing to report emergencies.

Responding to Emergencies

Although EPA does not require SQGs to have a written contingency plan, you must be prepared for an emergency at your facility. You should also be prepared to answer a set of "what if" questions. For example: "What if there is a fire in the area where hazardous waste is stored?" or "What if I spill hazardous waste, or one of my hazardous waste containers leaks?" In case of a fire, explosion, or toxic release, having such a plan provides an organized and coordinated course of action. SQGs are required to establish basic safety guidelines and response procedures to follow in the event of an emergency.

Worksheets 1 and 2 (on page 15) can help you set up these procedures. The information on Worksheet 1 must be posted near your phone. You must ensure that employees are familiar with these procedures.

SQG

Worksheet 1 Fill in and post this information next to your telephone.

EMERGENCY RESPONSE INFORMATION

Emergency Coordinator

Name: _____

_____

Telephone: _____

_____

_____

Fire Extinguisher

Location(s): _____

_____

_____

_____

Spill-Control Materials

Location(s): _____

_____

_____

Fire Alarm (if present)

Location(s): _____

_____

_____

_____

Fire Department

Telephone: _____

Worksheet 2 Fill in and post this information next to your telephone. Make sure all employees read and are familiar with its contents.

EMERGENCY RESPONSE PROCEDURES

In the event of a spill:

Contain the flow of hazardous waste to the extent possible, and as soon as is possible, clean up the hazardous waste and any contaminated materials or soil.

In the event of a fire:

Call the fire department and, if safe, attempt to extinguish the fire using a fire extinguisher.

In the event of a fire, explosion, or other release that could threaten human health outside the facility, or if you know that the spill has reached surface water:

Call the National Response Center at its 24-hour number (800 424-8802). Provide the following information:

Our company name:

_____

_____

Our address:

_____

_____

Our U.S. EPA identification number:

_____

Date of accident _____

Time of accident _____

Type of accident (e.g., spill or fire) _____

Quantity of hazardous waste involved _____

Extent of injuries, if any _____

Estimated quantity and disposition of recovered materials, if any

_____

SQG

SHIPPING WASTE OFF SITE

When shipping waste off site, SQGs must follow certain procedures that are designed to ensure safe transport and proper management of the waste.

Selecting a Treatment, Storage, and Disposal Facility (TSDF)

SQGs may send their waste only to a regulated Treatment, Storage, and Disposal Facility (TSDF) or recycler. Most regulated TSDFs and recyclers will have a permit from the state or EPA. Some, however, may operate under other regulations that do not require a permit. Check with the appropriate state authorities to be sure the facility you select has any necessary permits. All TSDFs and recyclers must have EPA identification numbers.

Labeling Waste Shipments

SQGs must properly package, label, and mark all hazardous waste shipments, and placard the vehicles in which these wastes are shipped following Department of Transportation (DOT) regulations. Most small businesses use a commercial transporter to ship hazardous waste. These transporters can advise you on specific requirements for placarding, labeling, marking, and packaging; however, you remain responsible for compliance. For additional information, consult the DOT regulations (49 CFR Parts 172 and 173) or call the DOT hazardous materials information line at 202 366-4488 or 800 467-4922.

Federal regulations allow you to transport your own hazardous waste to a designated TSDF provided that you comply with DOT rules. Some states, however, do not allow this practice. Call DOT and your state hazardous waste management agency regarding applicable regulations.

- Package, label, and mark your shipment, and placard the vehicle in which your waste is shipped as specified in DOT regulations.
- Prepare a hazardous waste manifest to accompany your shipment.
- Include a notice and certification with the first waste shipment.
- Ensure the proper management of any hazardous waste you ship (even when it is no longer in your possession).

SQG

Preparing Hazardous Waste Manifests

The Hazardous Waste Manifest System is a set of forms, reports, and procedures designed to seamlessly track hazardous waste from the time it leaves the generator until it reaches the off-site waste management facility that will store, treat, or dispose of the hazardous waste. The system allows the waste generator to verify that its waste has been properly delivered and that no waste has been lost or unaccounted for in the process.

The key component of this system is the Uniform Hazardous Waste Manifest, which is a multipart form prepared by most generators that transport hazardous waste for off-site treatment, recycling, storage, or disposal. The manifest is required by both the DOT and EPA. When completed, it contains information on the type and quantity of the waste being transported, instructions for handling the waste, and signatures of all parties involved in the off-site treatments, recycling, storage, or disposal process. Each party also must retain a copy of the manifest. This process ensures critical accountability in the transportation and disposal process. Once the waste reaches its destination, the receiving facility returns a signed copy of the manifest to the generator, confirming that the waste has been received.

At press time, the Uniform Hazardous Waste Manifest system is in the process of being updated and modernized. Please check the Internet at www.epa.gov/epaoswer/hazwaste/gener/manifest/index.htm.

EPA expects to standardize the content and appearance of the current manifest form so that the same form may be used by waste handlers nationwide. Other anticipated changes include improved tracking procedures and an option to complete, send, and store the mainfest information electronically.

Land Disposal Restrictions (LDR) Reporting Requirements

Regardless of where the waste is being sent, the initial shipment of waste subject to LDRs must be sent to a receiving TSDF or recycler along with an LDR notice. You must send an additional LDR notice if your waste or receiving facility changes. This notice must provide information about your waste, such as the EPA hazardous waste code and the LDR treatment standard. The purpose of this notice is to let the TSDF know that the waste must

SQG

meet treatment standards before it is land disposed. There is no required form for this notice, but your TSDF may provide a form for you to use. A certification may also be required in specific situations. Contact the RCRA Call Center, your state agency, or EPA regional office and consult 40 CFR Part 268 for help with LDR notification and certification requirements.

Export Notification

If you choose to export your hazardous waste, you must notify EPA 60 days before the intended date of shipment to obtain written consent. EPA's "Acknowledge-ment of Consent" document must accompany the shipment at all times. For more information on how to obtain the consent to export hazardous waste, contact the RCRA Call Center at 800 424-9346.

Closure

When you close your facility, you must ensure that all hazardous waste has been removed from your hazardous waste tanks, discharge-control equipment, and discharge confinement structures. In addition, any contamination you might have caused must be cleaned up and managed under all applicable hazardous waste regulations.

SQG

MANAGING USED OIL

EPA's used oil management standards are a set of "good housekeeping" requirements that encourage used oil handlers to recycle used oil instead of disposing of it. Used oil can be collected, refined and recycled, and used again—for the same job or a completely different task.

Used oil is defined as "any oil that has been refined from crude oil or any synthetic oil that has been used and, as a result of such use, is contaminated by physical or chemical impurities." To meet EPA's definition of used oil, a substance must meet each of the following criteria:

- **Origin.** Used oil must have been refined from crude oil or made from synthetic materials. Animal and vegetable oils are excluded from EPA's definition of used oil.
- **Use.** Oils used as lubricants, hydraulic fluids, head transfer fluids, buoyants, and for other similar purposes are considered used oil. Unused oil such as bottom clean-out waste from virgin fuel oil storage tanks or virgin fuel oil recovered from a spill do not meet EPA's definition of used oil because these oils have never been used. EPA's definition also excludes products used as cleaning agents or solely for their solvent properties, as well as certain petroleum-derived products such as antifreeze and kerosene.
- **Contaminants.** To meet EPA's definition, used oil must become contaminated as a result of being used. This includes residues and contaminants generated from handling, storing, and processing used oil. Physical contaminants can include dirt, metal scrapings, or sawdust. Chemical contaminants could include solvents, halogens, or saltwater.

The following types of businesses handle used oil:

- **Generators** are businesses that handle used oil through commercial or industrial operations or from the maintenance of vehicles and equipment. Examples include car repair shops, service stations, government motor pools, grocery stores, metalworking industries, and boat marinas. Farmers who produce less than an average of 25 gallons of used oil per month are excluded from generator status. Individuals who generate used oil through the maintenance of their personal vehicles and equipment are

SELECTING A TRANSPORTER OR TSDF/RECYCLER

It is important to choose your transporter and your TSDF carefully because you remain responsible for the proper management of your hazardous waste even after it has left your site.

For help in choosing a transporter or TSDF, check with the following sources:

- References from business colleagues who have used a specific hazardous waste transporter or TSDF.
- Trade associations for your industry that might keep a file on companies that handle hazardous waste.
- The Better Business Bureau or Chamber of Commerce in the TSDF's area, which might have a record of any complaints registered against a transporter or a facility.
- Your state hazardous waste management agency or EPA regional office, which can tell you whether the transporter or TSDF has an EPA identification number and a permit, if required. Facility information, including types and quantities of waste managed and violations assessed, can be accessed via the Envirofacts Internet site at <www.epa.gov/enviro>.

SQG

not subject to regulation under the used oil management standards.

- **Collection centers and aggregation points** are facilities that accept small amounts of used oil and store it until enough is collected to ship it elsewhere for recycling.
- **Transporters** are companies that pick up used oil from all sources and deliver it to re-refiners, processors, or burners. Transfer facilities are any structure or area where used oil is held for longer than 24 hours but not longer than 35 days.
- **Re-refiners and processors** are facilities that blend or remove impurities from used oil so the oil can be burned for energy recovery or reused.
- **Burners** burn used oil for energy recovery in boilers, industrial furnaces, or in hazardous waste incinerators.
- **Marketers** are handlers that either a) direct shipments of used oil to be burned as fuel in regulated devices or b) claim that certain EPA specifications are met for used oil to be burned for energy recovery in devices that are not regulated.

Although different used oil handlers have specific requirements, the following requirements are common to all types of handlers:

Storage

- Label all containers and tanks as Used Oil.
- Keep containers and tanks in good condition. Do not allow tanks to rust, leak, or deteriorate. Fix structural defects immediately.
- Never store used oil in anything other than tanks and storage containers. Used oil also can be stored in units that are permitted to store regulated hazardous waste.

Oil Leaks or Spills

- Take steps to prevent leaks and spills. Keep machinery, equipment, containers, and tanks in good working condition, and be careful when transferring used oil. Keep sorbent materials available at the site.
- If a leak or spill occurs, stop the oil from flowing at the source. If a leak can't be stopped, put the oil in another holding container or tank.
- Contain spilled oil using sorbent berms or spreading sorbent over the oil and surrounding area.
- Clean up the used oil and recycle it as you would have before it was spilled. If recycling is not possible, you must first make sure the used oil is not a hazardous waste and dispose of it appropriately. All used cleanup materials, including rags and sorbent booms, that contain used oil must also be handled according to the used oil management standards.
- Remove, repair, or replace the defective tank or container immediately.

Used oil requirements are detailed in 40 CFR Part 279. For more information, contact the Emergency Response Division's Information Hotline at 202 260-2342.

LQG

SUMMARY OF REQUIREMENTS FOR LARGE QUANTITY GENERATORS

If you are a Large Quantity Generator (LQG) (generating more than 2,200 lbs (1,000 kg) per month), you must comply with the full set of hazardous waste regulations. This table summarizes the federal LQG requirements. This is only a summary and does not include all of the LQG requirements. For more details, contact the RCRA Call Center at 800 424-9346, or TDD 800 553-7672, or see 40 CFR Part 262. Be sure to check with your state as well because certain states have additional or more stringent requirements than the federal government.

LQG Requirements	Summary
Hazardous Waste Determination (40 CFR Part 262.10) Generator Category Determination (40 CFR Part 262.10 (b) and 261.5 (b) and (c))	Identify all hazardous wastes you generate. Measure the amount of hazardous waste you generate per month to determine your generator category (e.g., LQG).
EPA Identification Numbers (40 CFR 262.12)	Obtain a copy of EPA Form 8700-12, fill out the form, and send it to the contact listed with the form. An EPA identification number will be returned to you for your location.
Prepare Hazardous Waste for Shipment Off Site (40 CFR Parts 262.30 - 262.33)	Package, label, mark, and placard wastes following Department of Transportation requirements. Ship waste using hazardous waste transporter.
The Manifest (40 CFR Parts 262.20 - 262.23, 262.42)	Ship waste to hazardous waste treatment, storage, disposal, or recycling facility. Ship hazardous waste off site using the manifest system (EPA Form 8700-22) or state equivalent.
Managing Hazardous Waste On Site (40 CFR Part 262.34)	Accumulate waste for no more than 90 days without a permit. Accumulate waste in containers, tanks, drip pads, or containment buildings. Comply with specified technical standards for each unit type.
Recordkeeping and Biennial Report (40 CFR Parts 262.40 - 262.41)	Retain specified records for 3 years. Submit biennial report by March 1 of even numbered years covering generator activities for the previous year.
Comply with Land Disposal Restrictions (40 CFR 268)	Ensure that wastes meet treatment standards prior to land disposal. Send notifications and certifications to TSDF as required. Maintain waste analysis plan if treating on site.
Export/Import Requirements (40 CFR Subparts E and F)	Follow requirements for exports and imports, including notification of intent to export and acknowledgement of consent from receiving country.
Air Emissions (40 CFR Part 265, Subpart CC)	If applicable, use various monitoring and control mechanisms to: • Control volatile organic compound (VOC) emissions from hazardous waste management activities. • Reduce organic emissions from process vents associated with certain recycling activities and equipment that is in contact with hazardous waste that has significant organic content. • Control VOCs from hazardous waste tanks, surface impoundments, and containers using fixed roofs, floating roofs, or closed-vent systems routed to control devices.
Closure (40 CFR Parts 265.111 and 265.114)	Decontaminate and remove all contaminated equipment, structures, and soil, and minimize the need for further maintenance of your site. Meet unit-specific closure standards for tanks, containment buildings, and drip pads.

WHERE TO GET MORE HELP

For further assistance in understanding the hazardous waste regulations applicable to you, contact your state hazardous waste agency. Other assistance resources include the EPA Resource Centers (including the RCRA Call Center), or your EPA regional office (page 24).

Also, see other related sections of the Code of Federal Regulations:

- Handling PCBs (40 CFR Part 761)
- Toxic Release Inventory (TRI) Reporting (40 CFR Part 372)
- Domestic Sewage Waste Disposal Reporting (40 CFR Part 403)
- Shipping Hazardous Materials (49 CFR Parts 171-180)

EPA and Other Federal Resource Centers

RCRA Call Center
U.S. Environmental Protection Agency
1200 Pennsylvania Ave, NW.
Washington, DC 20460
Phone: 800 424-9346, or TDD 800 553-7672. In Washington, DC: 703 412-9810, or TDD 703 412-3323
Web: www.epa.gov/epaoswer/hotline

Answers questions on matters related to solid waste, hazardous waste, and underground storage tanks. Also can be used to find and order EPA publications.

RCRA In Focus

RCRA in Focus is a series of short informational booklets that describes the RCRA regulations as they apply to specific industry sectors. The documents explain what RCRA is, who is regulated, and what hazardous waste is; provide a sample life cycle of a RCRA waste in each industry; include a quick reference chart of all applicable RCRA regulations and a series of waste minimization suggestions for various specific industrial processes; and provide information on other relevant environmental laws and a page of contacts and resources.

Individual issues of *RCRA in Focus* have been written for the following industries:

- Dry Cleaning (EPA530-K-99-005)
- Leather Manufacturing (EPA530-K-00-002)
- Motor Freight & Railroad Transportation (EPA530-K-00-003)
- Photo Processing (EPA530-K-99-002)
- Printing (EPA530-K-97-007)
- Vehicle Maintenance (EPA530-K-99-004)

Other issues of *RCRA in Focus* will cover:

- Wood Preserving/Wood Products
- Construction, Demolition & Renovation
- Metals Manufacturing
- Furniture Manufacturing
- Pharmaceutical Manufacturing
- Laboratories

Copies of *RCRA in Focus* can be obtained by contacting the RCRA Call Center at 800 424-9346 or TDD 800 553-7672 and requesting the document numbers listed above. You can also view the documents online at <www.epa.gov/epaoswer/hazwaste/id/infocus/index.htm>.

Small Business Ombudsman Clearinghouse/Hotline
U.S. Environmental Protection Agency
Small Business Ombudsman (1230C)
1200 Pennsylvania Ave, NW.
Washington, DC 20460
Phone: 800 368-5888 or 202 260-1211
Fax: 202 401-2302
Web: www.epa.gov/sbo

Helps private citizens, small businesses, and smaller communities with questions on all program aspects within EPA.

Department of Transportation (DOT) Hotline
Office of Hazardous Materials Standards (DOT)
Research and Special Programs Administration
400 7th Street, SW.
Washington, DC 20590-0001
Phone: 202 366-4488 or 800 467-4922
Fax: 202 366-3753
Web: http://hazmat.dot.gov

Answers questions on matters related to DOT's hazardous materials transportation regulations.

RCRA Docket Information Center (RIC)
U.S. Environmental Protection Agency
RCRA Docket Information Center (5305W)
1200 Pennsylvania Ave, NW.
Washington, DC 20460
Phone: 703 603-9230
Fax: 703 603-9234
E-mail: RCRA-Docket@epamail.epa.gov
Web: www.epa.gov/epahome/dockets.htm

Provides public access to all regulatory materials on solid waste and distributes technical and nontechnical information on solid waste.

Pollution Protection Information Clearinghouse (PPIC)
U.S. Environmental Protection Agency
1200 Pennsylvania Ave, NW.
Washington, DC 20460
Phone: 202 260-4659
Fax: 202 260-0178
E-mail: PPIC@epamail.epa.gov
Web: www.epa.gov/opptintr/library/libppic.htm

Provides a library and an electronic bulletin board (accessible by any PC equipped with a modem) dedicated to information on pollution prevention.

Information Resource Center
U.S. Environmental Protection Agency
Headquarters Library
1200 Pennsylvania Ave, NW.
IRC (3404)
Washington, DC 20460
Phone: 202 260-5922
Fax: 202 260-5153
E-mail: public-access@epamail.epa.gov
Web: www.epa.gov/natlibra/hairc

Maintains environmental reference materials for EPA staff and the general public, including books, journals, abstracts, newsletters, and audio-visual materials generated by government agencies and the private sector.

Methods Information Communication Exchange (MICE)
U.S. Environmental Protection Agency
OSW Methods Team
1200 Pennsylvania Ave, NW.
(5307W)
Washington, DC 20460
Phone: 703 676-4690 or 703 308-8855
Fax: 703 318-4682 or 703 308-0511
E-mail: mice@cpmx.saic.com
Web: www.epa.gov/sw-846

EPA Regional Offices

EPA Region 1
CT, MA, ME, NH, RI, VT
1 Congress Street
Suite 1100
Boston, MA 02114-2023
617 918-1111 or
800 372-7431 in Region 1
Library: 888 372-5427 or
617 918-1990

EPA Region 2
NJ, NY, PR, VI
290 Broadway
26th Floor
New York, NY 10007-1866
212 637-3000
Library: 212 637-3185

EPA Region 3
DC, DE, MD, PA, VA, WV
1650 Arch Street
Philadelphia, PA 19103-2029
215 814-5000 or
800 438-2474 in Region 3
Library: 215 814-5254

EPA Region 4
AL, FL, GA, KY, MS, NC, SC, TN
Atlanta Federal Center
61 Forsyth Street, SW
Atlanta, GA 30303-3104
404 562-9900
800 241-1754 in Region 4
Library: 404 562-8190

EPA Region 5
IL, IN, MI, MN, OH, WI
77 West Jackson Boulevard
Chicago, IL 60604
312 353-2000 or
800 621-8431 in Region 5

EPA Region 6
AR, LA, NM, OK, TX
1445 Ross Avenue
Suite 1200
Dallas, TX 75202-2733
214 665-2200 or
800 887-6063 in Region 6
Library: 214 665-6424

EPA Region 7
IA, KS, MO, NE
901 North 5th Street
Kansas City, KS 66101
913 551-7000 or
800 223-0425 in Region 7
Library: 913 551-7241

EPA Region 8
CO, MT, ND, SD, WY, UT
One Denver Place
999 18th Street
Suite 500
Denver, C0 80202-2466
303 312-6312 or
800 227-8917 in Region 8

EPA Region 9
AS, AZ, CA, GU, HI, MH, MP, NV
75 Hawthorne Street
San Francisco, CA 94105
415 744-1305
Library: 415 744-1510

EPA Region 10
AK, ID, OR, WA
1200 Sixth Avenue
Seattle, WA 98101
206 553-1200 or
800 424-4372 in Region 10
Library: 206 553-1289

Worksheet 3 These questions are geared toward the federal requirements for SQGs but may be helpful for other hazardous waste generators. Use them to help prepare for a visit from a federal, state, or local agency.

Yes	No	
☐	☐	Do you have documentation on the amount and kinds of hazardous waste that you generate and on how you determined that they are hazardous?
☐	☐	Do you have a U.S. EPA identification number?
☐	☐	Do you ship wastes off site?
☐	☐	If so, do you know the name of the transporter and the designated TSDF that you use?
☐	☐	Do you have copies of completed manifests used to ship your hazardous wastes over the past 3 years?
☐	☐	Are they filled out correctly?
☐	☐	Have they been signed by the designated TSDF and transporter?
☐	☐	If you have not received your signed copy of the manifest from the TSDF, have you filed an exception report?
☐	☐	Is your hazardous waste stored in proper containers or tanks?
☐	☐	Are the containers or tanks properly dated and/or marked?
☐	☐	Have you complied with the handling requirements described in this handbook?
☐	☐	Have you designated an emergency coordinator?
☐	☐	Have you posted emergency telephone numbers and the location of emergency equipment?
☐	☐	Are your employees thoroughly familiar with proper waste handling and emergency procedures?
☐	☐	Do you understand when you need to contact the National Response Center?
☐	☐	Do you store your waste for no more than 180 days, or 270 days if you ship your waste more than 200 miles?

ACRONYMS AND DEFINITIONS

Byproduct

A material that is not one of the primary products of a production process. Examples of byproducts are process residues such as slags or distillation column bottoms.

CESQG—Conditionally Exempt Small Quantity Generator

A business that generates less than 220 lbs (100 kg) per month of hazardous waste.

CFR—Code of Federal Regulations

The CFR is a codification of the general and permanent rules published in the Federal Register by the Executive departments and agencies of the federal government. The CFR is divided into 50 "titles," which represent broad areas subject to federal regulation. Each title is divided into chapters, which usually bear the name of the issuing agency.

Commercial Chemical Product

A chemical substance that is manufactured or formulated for commercial or manufacturing use.

Container

Any portable device in which a material is stored, transported, treated, disposed of, or otherwise handled.

DOT—Department of Transportation

Federal agency that oversees all national transportation systems and regulates the transport of hazardous materials.

Elementary Neutralization Unit

A tank, tank system, container, transport vehicle, or vessel (including ships) that is designed to contain and neutralize corrosive waste.

Implementing Agency

EPA regional office or state agency responsible for enforcing the hazardous waste regulations.

Incompatible Waste

A hazardous waste that can cause corrosion or decay of containment materials, or is unsuitable for comingling with another waste or material because a dangerous reaction might occur. See 40 CFR Part 265, Appendix V for more examples.

LDR—Land Disposal Restrictions

The LDR program ensures that toxic constituents present in hazardous waste are properly treated before hazardous waste is disposed of in the land (such as in a landfill).

LQG—Large Quantity Generator

A business that generates more than 2,200 lbs (1,000 kg) per month of hazardous waste.

MICE—Methods Information Communication Exchange

The MICE service provides answers to questions about test methods used to determine whether a waste is hazardous. It also takes comments on technical issues regarding EPA's methods manual known as Test Methods for Evaluating Solid Waste: Physical/Chemical Methods (SW-846).

MSDS—Material Safety Data Sheets

Chemical manufacturers and importers prepare detailed technical bulletins called Material Safety Data Sheets about the hazards of each chemical they produce or import. Your suppliers must send you an MSDS at the time of the first shipment of a chemical and any time the MSDS is updated with new and significant information about the hazards. MSDSs include information about components and contaminants, including exposure limits, physical data, fire and explosion hazard, toxicity, and health hazard data. It also discusses emergency and first aid procedures and information about storage and disposal, and spill or leak procedures.

NFPA—National Fire Protection Association

NFPA's mission is to reduce the worldwide burden of fire and other hazards on the quality of life by providing and advocating scientifically based codes and standards, research, training, and education. NFPA has specific rules for storing hazardous wastes.

PBT—Persistent, Bioaccumulative, and Toxic

Persistent chemicals are those that don't readily break down in the environment and can be transferred among air, water, soils, and sediments. Bioaccumulative chemicals are those that concentrate in animal and plant tissues as a result of uptake from the surrounding environment or as a result of one organism consuming another. Toxic chemicals, in this context, are those that are hazardous to human health and the environment. EPA has been tasked with focusing on reducing the toxicity of wastes in addition to the quantity of waste, and its Waste Minimization National Plan focuses on reducing PBT wastes.

POTW—Publicly Owned Treatment Works

A municipal wastewater treatment plant that receives wastewater through the public sewer from households, office buildings, factories and industrial facilities, and other places where people live and work.

Reclaimed Material

Material that is regenerated or processed to recover a usable product. Examples are the recovery of lead values from spent batteries and the regeneration of spent solvents.

Recovered Material

A material or byproduct that has been recovered or diverted from solid waste. Does not include materials or byproducts generated from, and commonly used within, an original manufacturing process.

Recycled Material

A material that is used, reused, or reclaimed.

Reused Material

A material that is employed as an ingredient in an industrial process to make a product, or is used as an effective substitute for a commercial product.

Spent Material

Any material that has been used and, as a result of contamination, can no longer serve the purpose for which it was produced without first processing it.

SQG—Small Quantity Generator

A business that generates between 220 and 2,200 lbs (100 and 1,000 kg) per month of hazardous waste.

Sludge

Any solid, semi-solid, or liquid waste generated from a municipal, commercial, or industrial wastewater treatment plant, water supply treatment plant, or air pollution control facility, exclusive of the treated effluent from a wastewater treatment plant.

Still Bottom

Residue or byproduct of a distillation process such as solvent recycling.

Tank

A stationary device designed to contain an accumulation of hazardous waste and that is constructed primarily of nonearthen materials (e.g., wood, concrete, steel, plastic).

Totally Enclosed Treatment Facility

A facility for the treatment of hazardous waste that is directly connected to an industrial production process and that is constructed and operated to prevent the release of hazardous waste into the environment during treatment. An example is a pipe in which waste acid is neutralized.

TCLP—Toxicity Characteristic Leaching Procedure

A testing procedure used to determine whether a waste is hazardous. The procedure identifies waste that might leach hazardous constituents into ground water if improperly managed.

TSDF—Treatment, Storage, and Disposal Facility

Refers to a facility that treats, stores, or disposes of hazardous waste; TSDFs have specific requirements under RCRA.

VOCs—Volatile Organic Compounds

VOCs are highly evaporative organic gases that can be produced during the manufacture or use of chemicals such as paints, solvents, and cleaners. Various pollution control devices can prevent the release of VOCs both outdoors and indoors.

Wastewater Treatment Unit

A tank or tank system that is subject to regulation under either Section 402 or 307(b) of the Clean Water Act, and that treats or stores an influent wastewater that is hazardous waste, or that treats or stores a wastewater treatment sludge that is hazardous.

EPA
United States
Environmental Protection Agency (5305W)
Washington, DC 20460

Official Business
Penalty for Private Use $300

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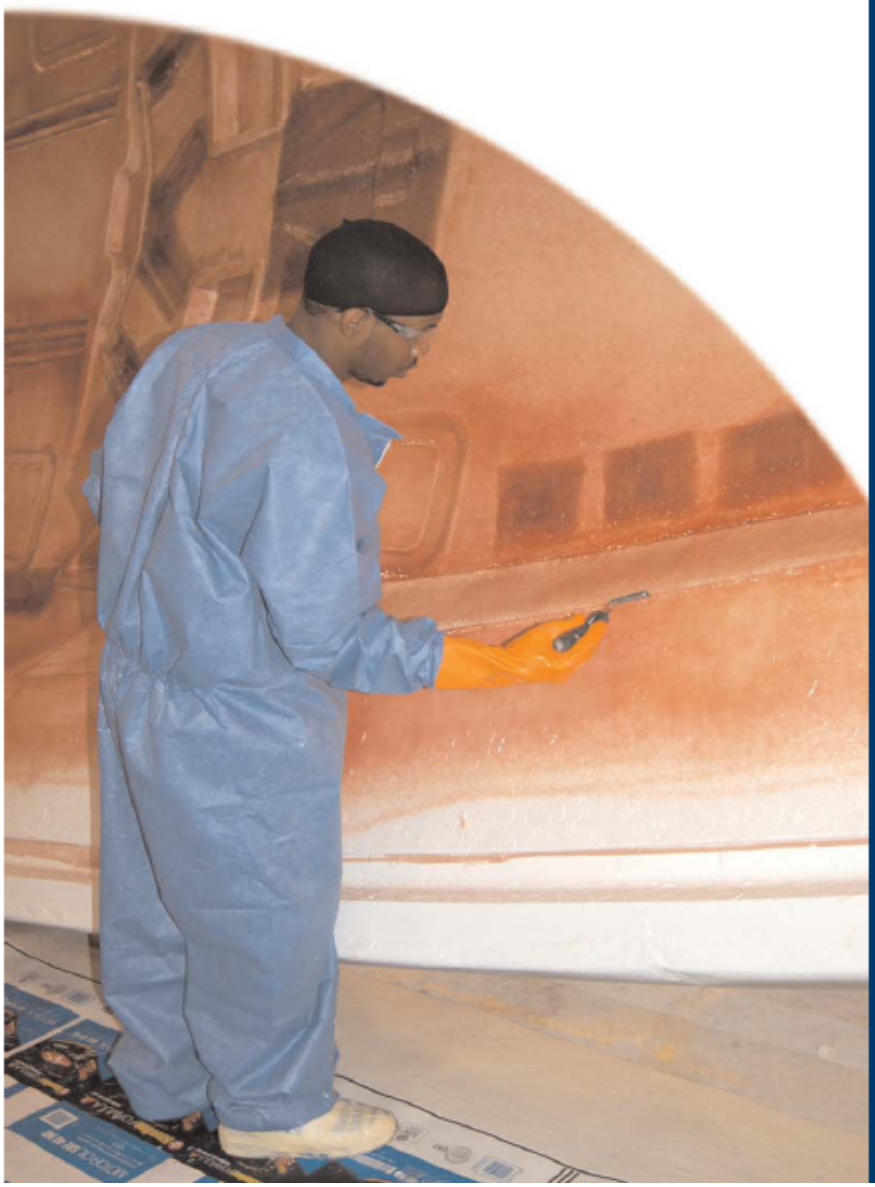
Appendix P **A GUIDE on HAZARDOUS WASTE MANAGEMENT for FLORIDA'S FIBER-REINFORCED PLASTIC MANUFACTURERS**

A Guide on Hazardous Waste Management for Florida's Fiber-Reinforced Plastic Manufacturers



Florida Department of Environmental Protection Hazardous Waste Compliance Assistance Program

This document was published to help educate businesses on hazardous waste management issues affecting them. The suggested options may help businesses to operate in an environmentally appropriate manner. Some of the options may go beyond what is required to remain in compliance with regulations. Business owners are responsible for obtaining complete information about applicable regulations. Misrepresentations or omissions by the Florida Department of Environmental Protection or the Florida Center for Solid and Hazardous Waste Management do not relieve any person from any requirement of federal regulations or Florida law.

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These regulations are available at many public libraries. In addition, the Florida Department of Environmental Protection and the United States Environmental Protection Agency have posted links to copies of these regulations on the agencies' Internet sites:

http://www.dep.state.fl.us
http://www.epa.gov

These sites also provide access to agency forms, fact sheets, checklists, rule summaries, answers to frequently asked questions and reports from our public information databases. Individuals who do not have Internet access may obtain copies of department publications through the contact information listed on page 17 of this document.

Revised June 2003

Why should I care about hazardous wastes?

As a business owner, operator or employee, you may be producing materials that can harm people and the environment. This booklet offers helpful tips on how to:

- Comply with federal and state hazardous waste regulations.
- Avoid penalties by properly managing hazardous wastes.
- Save money on disposal costs by reducing hazardous wastes.

Health and Environment

Hazardous wastes spilled or dumped on the ground or disposed in dumpsters may seep into the groundwater and contaminate drinking water supplies.

Hazardous wastes may run off into the nearest body of water where they may poison or kill fish and other wildlife.

Hazardous wastes pose a risk to you, your employees and your community.

Cost Savings

State and county inspectors may visit your business to ensure that hazardous wastes are being managed properly. State penalties range from $100 to $50,000 **per violation per day**.

Reducing hazardous wastes can reduce your production and disposal costs and reduce your risk of future liability.

Public Image

Your customers will appreciate your efforts to prevent pollution.

Your community will recognize your business as a good neighbor.

What is a hazardous waste?

A waste is hazardous if:

- It is listed as a hazardous waste in the Title 40 Code of Federal Regulations (CFR) Part 261, Subpart D.
- It has any of the characteristics described below:

Characteristic Wastes

Ignitable

Ignitable wastes are flammable or spontaneously combustible. If they have a flashpoint of less than 140 degrees Fahrenheit or an alcohol content of 24% or more, they are hazardous wastes. Examples include some paints, paint solvents, other solvents and degreasers.

Corrosive

Corrosive wastes can burn the skin or corrode metals. Liquids with a pH of 2 or lower or 12.5 or higher are corrosive. Examples include rust removers, acidic or alkaline fluids and battery acid.

Reactive

Reactive wastes are unstable and may explode or react violently with water or other materials. Examples include bleaches, oxidizers, cyanides and explosives, such as sodium azide and dynamite.

Toxic

Wastes are toxic if they contain certain heavy metals above specific concentrations, such as chromium, lead or cadmium, or toxic organic chemicals. Examples include some parts cleaners and chromium-bearing paints.

Listed Wastes

Some industrial processes and chemical wastes are listed specifically as hazardous in the federal regulations under 40 CFR 261, Subpart D. Copies of the rule can be found at many public libraries, on the internet (http://www.access.gpo.gov/nara/cfr/) or may be purchased from the Government Printing Office.

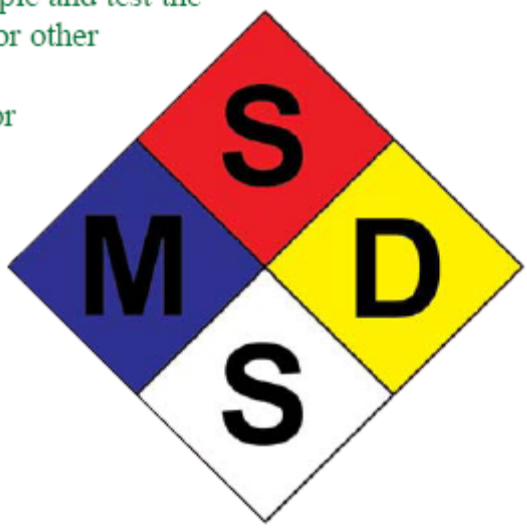
Acutely Hazardous Wastes

Small amounts of very dangerous wastes, such as arsenic and cyanide compounds, are regulated in the same way as large amounts of other wastes. A business that generates 2.2 pounds (1 kilogram) or more of these acutely hazardous wastes per month is subject to full regulation under the hazardous waste rules.

Identifying Your Hazardous Wastes

It is very important to determine whether a waste is hazardous or non-hazardous. There are several ways to identify hazardous wastes.

- Always ask for a Material Safety Data Sheet (MSDS) before ordering any new product. The MSDS will give you valuable information about the product. Note: the MSDS does not identify chemicals present in concentrations less than 1%, or 10,000 parts per million.
- Talk to product suppliers and manufacturers.
- Read product labels.
- Compare product and process information to hazardous waste characteristics and to wastes listed in federal regulations.
- If product or process information is not available or is inconclusive, have a commercial lab sample and test the waste using the TCLP test or other appropriate analytical tests.
- A non-hazardous material or product may become a hazardous waste due to contaminants added during use. Lab testing may be necessary.



Sources of Hazardous Waste

Fabrication

Gelcoat and Resin Applications

Excess gelcoat, which is about 35% styrene, and other resins are primary sources of hazardous waste. Resin wastes can be minimized with equipment that has greater transfer efficiency. Reducing waste saves money and makes cleanup easier.

Liquid Wastes

Some of the most common solvents used for cleaning equipment, hands and resins are hazardous. Examples include acetone, mineral spirits, paint/lacquer thinners and solvent distillation bottoms from solvent recovery units.

Solid Wastes

Hazardous solid wastes may include unsolidified resins, excess putty and adhesives that have not hardened, solvent distillation bottoms from solvent recovery units, spray booth filters and solvent-contaminated towels, wipes and rags.

Cleanup

Rags contaminated with used oil or solvents may be a hazardous waste. If your shop washes rags, water must be discharged to a publicly owned sanitary sewer, not a storm sewer, septic tank or cesspool. If you use a towel service, make sure the company discharges its water to a publicly owned sewer system.

Disposable rags or paper towels used with hazardous substances should be disposed as hazardous wastes. They should not be disposed in the dumpster.

Typical Hazardous Wastes

Styrene

A primary component of gelcoat and other polyester resins.

Flash point: 90° F
Corrodes copper.
Affects the central nervous system, lungs and skin.

Methyl Ethyl Ketone Peroxide (MEKP)

May be explosive.

Flash point: 185° F
May react strongly with other substances. Refer to MSDS. Incompatible with very stong oxidizers, acids and bases. Skin and nose irritant. Can cause blindness. Affects the central nervous system.

Acetone

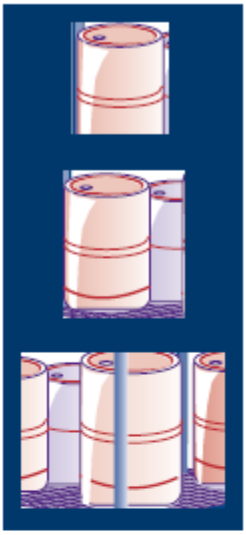
Flash point: 0° F
Incompatible with acids and oxidizers.
Irritant for eyes, nose, throat and skin.
Central nervous system depressant.

Acetone Substitutes

Various high flash point acetone substitutes are available, such as propylene carbonate and dibasic ester (DBE). However, the spent material may be ignitable due to mixture with ignitable resins and gelcoats. If you change your process to use an acetone substitute, waste should be tested prior to disposal.

How should I manage hazardous wastes?

First, determine how much hazardous waste you generate **each month**. The rules you must follow depend on how much you generate, how much you store and how long you store it.



Less than 220 pounds (100 kilograms or about half a drum): you are a "Conditionally Exempt Small Quantity Generator" (CESQG).

220 - 2,200 pounds (100-1,000 kilograms or about half a drum to 5 drums): you are a "Small Quantity Generator" (SQG).

More than 2,200 pounds (1,000 kilograms or more than about 5 drums): you are a "Large Quantity Generator" (LQG).

The following practices may be required for your business. Even if they are not required, they are good waste management practices. Additional information is available from FDEP.

Containers

- Maintain containers in good condition. Prevent leaks, ruptures and accumulation of rainwater on tops of drums.
- If a container leaks, transfer waste to a new container.
- Keep containers closed. Use self-closing funnels when adding waste. Do not allow wastes to evaporate; this is a serious offense.
- Wastes must be compatible with the container. For example, use HDPE plastic containers for corrosive wastes.
- Never place incompatible wastes, such as wastes that react with each other (e.g., acids and bases) in the same container.

Storage

- Maintain adequate aisle space between container rows to allow inspection for leaks and damages.
- Store ignitable and reactive wastes at least 50 feet from property boundaries.
- Store containers with incompatible wastes in separate areas.
- Time limit for SQGs is 180 days. It is 90 days for LQGs.

Labels

HAZARDOUS WASTE
Federal Law Prohibits Improper Disposal
If found, please contact the nearest police, public safety authority or the US EPA

(Your business name, address and manifest document number)

- The above label represents proper wording for a hazardous waste label. You must also comply with FDOT.
- Label every container with the type of waste and whether it is hazardous or non-hazardous.
- Include the accumulation start date (the date when waste was first placed in the container).
- Include your business' name and address.
- Include federal waste code numbers.

Transport and Disposal

- Make sure your transport and disposal facility have US EPA identification numbers.
- Use manifests for all hazardous wastes shipped off-site. Keep the manifests on-site.

Inspections and Recordkeeping

- Inspect containers at least once a week and keep a written log of container inspections.
- Keep a record of larger spills and use this information to identify the spill prevention options that might help your business.
- Keep training and inspection records for three years.
- Keep manifests and shipping receipts for three years.
- Keep records of lab tests for three years.
- Keep land disposal restriction forms for three years from the date the waste was last shipped.

Training

- Train all personnel to identify, reduce and properly handle wastes.
- Train new employees before they handle hazardous wastes.
- Inform employees of the importance of pollution prevention.

How can I reduce hazardous wastes?

Reducing hazardous wastes makes good business sense. Benefits include:

- Saving money on waste management costs.
- Reducing concerns about penalties and liability.
- Creating a safer, healthier workplace.
- Promoting positive public relations with clients, customers and the local community.

Where to begin

- Make a commitment to reducing wastes in every area of your business.
- Evaluate your shop's wastes and identify areas where changes can be made.
- Encourage the participation of all employees through education, training and incentives.

Solvents

- Reduce solvent waste by replacing solvent only when necessary.
- Replace organic solvents with emulsifiers.
- Replace acetone and other solvents with non-hazardous solvents, such as propylene carbonate, or less hazardous solvents, such as dibasic ester (DBE).
- Recycle solvent wastes on-site in a distillation unit and reuse them.
- Reduce solvent rinse usage by using squeegees to remove excess resins.
- Use a two-stage cleaning process (dirty solvent followed by clean rinse) to reduce solvent usage.
- Use self-closing funnels to add waste to containers.

Training

- Train new employees to use solvents and chemicals efficiently, using minimal amounts to get the job done.
- Ensure that employees follow label directions and precautions listed on Material Safety Data Sheets (MSDS).

Fabrication

- Reduce resin waste by using flow cutters, airless sprayers and power rollers.
- Consider using non-spray resin application methods.
- Reduce overspray by changing spray orientation.
- Replace high-pressure air systems with airless or air-assisted equipment to reduce fogging, overspray and bounceback.
- Prevent contamination of resin buckets.

Shop Practices

- Minimize inventory and use a "first-in, first-out" system to prevent the need for disposal of old, unused materials.
- Store raw materials and wastes in closed containers in a covered area protected from rain and sunlight.
- Use drip trays under solvent storage drums.
- Prevent leaks and spills. Keep floors clean.
- Use the least hazardous type of floor cleaner available.
- For dirty rags, use an approved laundry service that discharges its water to a publicly owned sewer system.
- Do not discharge wastes to the ground surface. Plug floor drains.

Dos and Don'ts

DO
Keep containers closed

DON'T
Leave containers open

DO
Keep accurate inspection logs

DO
Label all containers

DON'T
Leave containers unlabeled

Who needs to know if my business generates hazardous waste?

Post Emergency Information

Post the following information near every telephone:

* Fire department phone number.
* Emergency coordinator's name and phone number.
* Locations of fire alarms and extinguishers.
* Locations of spill control materials.

Notify FDEP

If your business is a small or large quantity generator, notify FDEP to obtain a US EPA identification number. Local environmental agencies also should be notified.

Notify local authorities

Police and fire departments and local hospitals that would respond to an emergency need to know that there are hazardous wastes on your property.

Designate an emergency coordinator

This person must know what to do in case of fire, spill or other emergency and must be on the premises or on call 24 hours a day.

Develop a contingency plan

Guidance on contingency plans is available from FDEP. Large quantity generators must have a written plan that includes:

* Emergency response arrangements with police and fire departments, hospitals and emergency response contractors.
* Emergency coordinator's address and phone number.
* On-site emergency equipment descriptions and locations.
* Evacuation plan and routes, including a site diagram.
* Spill reporting procedures.

Smaller generators (SQGs and CESQGs) also should have a contingency plan.

Tips from Inspectors

Drums

- You cannot have any mystery drums. All drums must be labeled and have a "birthdate" on them.
- Evaporation of hazardous waste is a serious violation. Do not allow the hazardous wastes to evaporate. When you are not in the process of putting waste into the drum, you must keep it closed.
- You also are required to keep the top of the drum clean.
- Do not store old drums outside. If they get stormwater inside them, you will have to sample the stormwater and determine whether the water in the drum is hazardous. Insist that the person who sold you the drum and its contents takes the drum back when you are done with it.
- Inspectors go into dumpsters and walk the entire property line of a business. They go back into trees looking for orphan drums and distressed/dead vegetation.

Spills

- Clean up your spills at the time of the spill.

Transport

- The only generators who are allowed to transport their own waste are conditionally exempt small quantity generators. All other generators must use a hazardous waste hauler that has a permit from the FDEP and the US EPA.

Waste

- The most common violation is the non-determination of whether something is a waste.
- Abandoned products are wastes.
- If you throw away containers, make sure the container is completely empty and rinsed before you place it in a waste receptacle. If you throw away aerosol cans, make sure the can has a hole in it, and that you have drained the liquids out of the can. If you are throwing away paint containers, be sure to drain all the paint out of the container.

Water

- If you discharge any waste that could be construed as a hazardous waste into a city sewer, you must have the written permission of the city sewer system. The city sewer system must be a Publicly Owned Treatment Works (POTW). It cannot be a privately owned package plant.
- If you use rags, you should send the rags to a linen service that is served by a publicly-owned sewage treatment plant. If you use paper towels, you must make a determination as to whether the used paper towels are a hazardous waste.
- Know where your drains go. All drains that lead from a hazardous materials area to a stormwater area should be sealed shut.

Checklist

This checklist will help you prevent the most common hazardous waste violations. For more detailed information on hazardous waste management requirements, contact FDEP.

- ☐ Each month, identify and record types and quantities of hazardous waste.
- ☐ Notify FDEP and obtain a US EPA identification number.
- ☐ Use proper containers to collect and store wastes.
- ☐ Label all containers, whether product or waste, as to their contents.
- ☐ Include accumulation start dates on labels.
- ☐ Keep all containers of hazardous waste or products containing regulated solvents closed at all times unless actively removing from or adding to them.
- ☐ Maintain aisle space between containers for inspection.
- ☐ Inspect containers weekly for rust, leaks or damage and keep a log
- ☐ Train employees to properly handle hazardous wastes.
- ☐ Designate an emergency coordinator.
- ☐ Post emergency information near each phone.
- ☐ Develop a contingency plan for emergencies.
- ☐ Use manifests for all waste transported for disposal.
- ☐ Keep all records for at least three years.

Where can I get more information?

Additional information on hazardous waste reduction and regulations is available from many sources.

Florida Department of Environmental Protection

District offices and the Tallahassee office offer technical assistance, fact sheets and other publications on hazardous waste regulations.

Hazardous Waste Compliance
Assistance Program
Phone: (800) 741-4DEP
(850) 245-8707
Fax: (850) 245-8810

Available publications include:

- Summary of Hazardous Waste Regulations
- Requirements for Conditionally Exempt Small Quantity Generators
- Requirements for Small Quantity Generators
- Handbook for Small Quantity Generators of Hazardous Waste

U.S. Environmental Protection Agency

The US EPA has published a series of industry-specific guidelines and handbooks on preventing pollution and complying with hazardous waste regulations.

RCRA Hotline: (800) 424-9346

Your Trade Associations

Many trade associations have published guides to help you find solutions to your hazardous waste management problems.

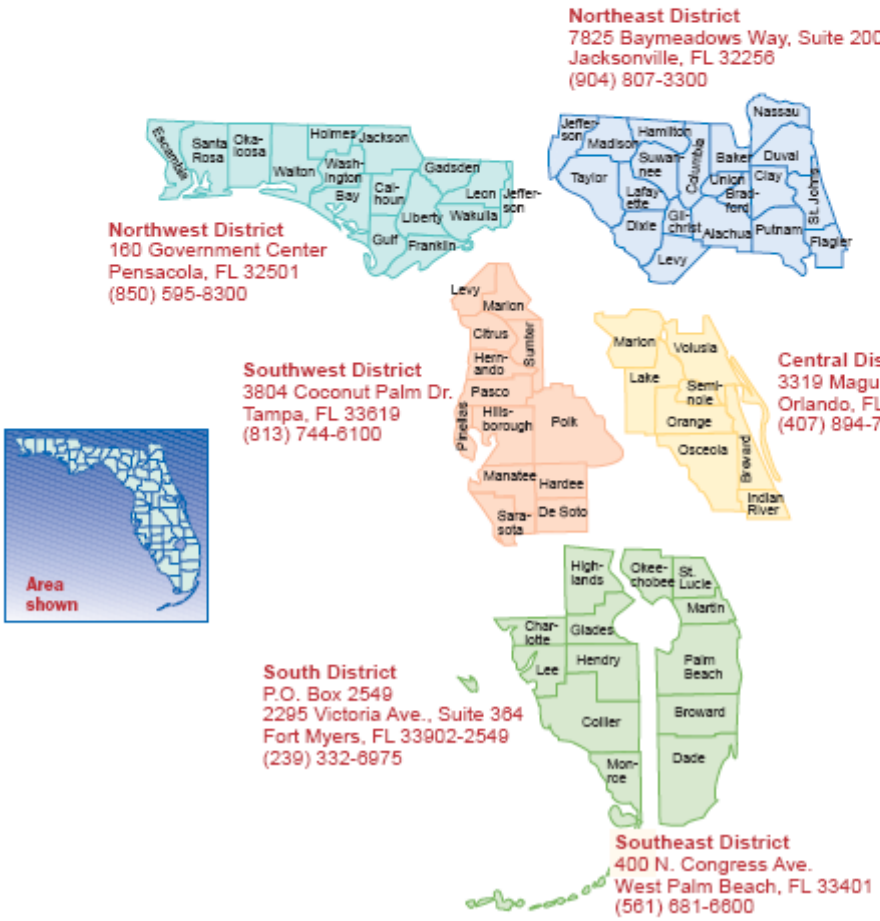
Florida Small Business Assistance Program

The Small Business Assistance Program helps businesses with environmental concerns and problems related to compliance with air regulations. Assistance is confidential and staff experts have business experience.

Phone: (800) 722-7457

Offices of the Florida Department of Environmental Protection

Hazardous Waste Regulation Section
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, FL 32399-2400
(800) 741-4DEP



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For additional information contact:
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Phone: (800) 741-4337
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Appendix Q **CLEANING UP CONTAMINATED SITES**

Florida

STATE OF THE ENVIRONMENT

Cleaning Up Contaminated Sites

Florida Department of Environmental Protection

Introduction

So you either know, or assume, your property is contaminated. What do you do? What *can* you do? You know that the property has to be cleaned up. But how? Who will do the cleanup? What are you legally required to do? And who is financially responsible?

This pamphlet -- *Florida, State of the Environment: Cleaning Up Contaminated Sites* -- was created to answer some of the general questions you have about the cleanup of contaminated sites. Although the cleanup process can be difficult and somewhat intimidating, this pamphlet will give you a summary of the process and get you started in the right direction.

What is Contamination?

A contaminant is any substance that, in certain quantities, is known to be harmful or fatal to plant, animal, or human life. In general, when contaminants enter air, soil, groundwater, or surface water, contamination of the environment occurs.

Why is cleanup important?

The prevention and cleanup of contamination caused by releases of chemicals and other waste into the environment is one of the nation's major concerns. But nowhere is it of greater importance than in Florida, where protection of groundwater - the source of almost 90 percent of Florida's drinking water – is essential. Additionally, the recreational benefits and fish and wildlife habitats provided by Florida's clean surface waters also must be protected. Florida's natural resources are vital to the quality of life its residents and visitors expect and enjoy.

We normally think of Florida as a beautiful, unspoiled state, but contamination does exist. While Florida's stringent environmental laws help to prevent contamination by today's activities, actions from the past have left Florida a legacy of thousands of contaminated sites. Even today, disposal of hazardous substances by illegal, "midnight dumpers" or accidental leaks or spills can contaminate groundwater in Florida. Additionally, Florida's rapid growth and frequent changes in land use often result in the need for contaminated site cleanup.

The Cleanup Process

The cleanup process has three main steps:

1. Assessment of the contaminated site
During the assessment phase, soil and water samples from within and around the site are collected and analyzed to determine the type and extent of contamination and what cleanup may be required.

2. Selection of the remedy to clean up the site
During this phase, registered and licensed professionals develop a plan to clean up the site or manage the risk posed by the site. At some sites where the potential for exposure to contamination is minimal, it may be possible to simply monitor while natural processes clean up the site. In other cases, active cleanup may be necessary to treat contaminated soil or water in place or remove it for treatment and disposal.

3. Cleaning up the site (remedial action)
If active cleanup is required, the first step is to build the system that will clean up your site. There are many different types of cleanup systems. Some pump water from the ground for treatment to remove contaminants and others may be designed to remove contaminants from groundwater without pumping. The cleanup system design is determined by the geology of the site, the contaminants present, and time and cost considerations. Once the system is built, it's time to operate and maintain the system.

The Operation and Maintenance (O&M) component of the cleanup process may consist of site visits on a monthly or quarterly basis to make sure the system performs as designed. These site visits may include collection of more soil, water, and air samples to make sure the treatment system is functioning properly and that you are making progress towards cleaning up the site. The O&M phase of cleanup continues for months, and in some cases, years depending on the extent of contamination.

The final component of site cleanup is the monitoring phase. After cleanup appears complete, the remediation system is temporarily shut down and the site is monitored for a period of about one year. This is done to make sure your site is actually clean and no further action needs to be taken on the property. Sometimes contamination reappears during this monitoring period and it is necessary to restart the active cleanup for a period of time.

Florida Department of Environmental Protection
2600 Blair Stone Road MS 4505
Tallahassee, Florida 32399-2400

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Frequently Asked Questions

Q: How long will it take to clean up the site and how much will it cost?

A: *Site cleanup times and costs depend on a number of different things such as the types of contaminants present, the degree and extent of the contamination, and the geology of the site. In other words, no two cleanups are alike; so it is difficult to predict just how much it will cost or how long it will take.*

Q: Will cleanup operations disrupt my business or property?

A: *They shouldn't. With proper planning and coordination, cleanup activities should cause minimal disruptions to other site activities.*

Q: Can I do the cleanup work myself?

A: *Probably not. Cleanup work should be done by environmental professionals and experienced cleanup contractors. Some components require certification by registered and licensed professional geologists (P.G.'s) or registered and licensed professional engineers (P.E.'s).*

Q: What happens if I don't clean up my site?

A: *Many things can happen. Most importantly, the environment remains contaminated, which ultimately may cause health problems for you and others. You probably won't be able to sell your property. And finally, the FDEP, the U.S. Environmental Protection Agency, or affected third parties, could take legal action.*

Q: Who or What is "Rebecca"?

A: *Risk-Based Corrective Action (RBCA, pronounced "Rebecca") is a process that emphasizes source removal and control to prevent the spread of contamination. To reduce cleanup costs when possible, RBCA allows for reliance on natural processes and time to take care of low-level contamination when it is safe to do so.*

Q: What environmental consulting firm should I hire to oversee the cleanup of contamination on my property?

A: *Consult with other people experienced with using environmental consulting firms to help you decide which firm will meet your needs. Refer to the yellow pages of your phone book, contact trade associations or contact your local or state environmental agency for a listing of the available environmental consulting firms in your area. The FDEP cannot recommend specific firms. Ask any potential firm how many sites like yours they have cleaned up in Florida.*

Q: Will I be liable if I buy a piece of property, which already has contamination?

A: *It's likely. Florida's "due diligence" laws make it prudent to conduct an environmental audit prior to purchasing property. In fact, most lenders require it. An environmental audit will determine the likelihood of contamination on a property based on a site background search and assessment activities.*

For More Information

Write To:

Florida Department of Environmental Protection
2600 Blair Stone Road, MS 4505
Tallahassee, Florida 32399-2400
Attn: Cleaning Up Contaminated Sites

Internet Addresses:

(Visit your local public libraries, community schools, etc. for access to personal computers and the Internet.)

Division of Waste Management home page:
www.dep.state.fl.us/waste

Florida DEP home page:
www.dep.state.fl.us

State of Florida home page:
www.myflorida.com

Call:

Bureau of Waste Cleanup

• Brownfields Redevelopment	(850) 488-0190
• Drycleaning Solvent Cleanup	(850) 488-0190
• Hazardous Waste Cleanup	(850) 488-0190
• Site Investigation	(850) 488-0190
• Technical Review	(850) 488-3935
• General Questions	(850) 488-0190

Bureau of Petroleum Storage Systems

• Storage Tank Regulation	(850) 488-3935
• Petroleum Cleanup Program	(850) 487-3299
• General Questions	(850) 921-0896

District Telephone Numbers

• Northwest District (Pensacola)	(850) 595-8360
• Northeast District (Jacksonville)	(904) 807-3300
• Central District (Orlando)	(407) 894-7555
• Southwest District (Tampa)	(813) 744-6100
• Southeast District (W. Palm Bch)	(561) 681-6600
• South District (Ft. Myers)	(941) 332-6975

Getting It Right The First Time

You can expedite the cleanup process and reduce cleanup costs if you do the following:

√ ***Conduct Source Removal.***

Source removal includes repairing or removing leaking tanks or piping; removing liquid and sludges from pits, ponds and lagoons; and removing soils saturated with contaminants. In some cases, source removal can be done before site assessment and determination of the final cleanup plan for a site.

√ ***Obtain the services of a reputable environmental consulting firm or cleanup contractor.***

Consultants and contractors that do not correctly complete the steps of the cleanup process may cause these steps to be repeated, resulting in delays and higher costs. The FDEP may require additional work because of consultant or contractor oversight.

Many times, the least expensive estimate is not necessarily the best. Beware of quotes that seem too good to be true. They usually are. An initial assessment by a consultant or contractor may not reveal the entire extent of the contamination, resulting in the need for more assessment and consequently lost time and higher costs.

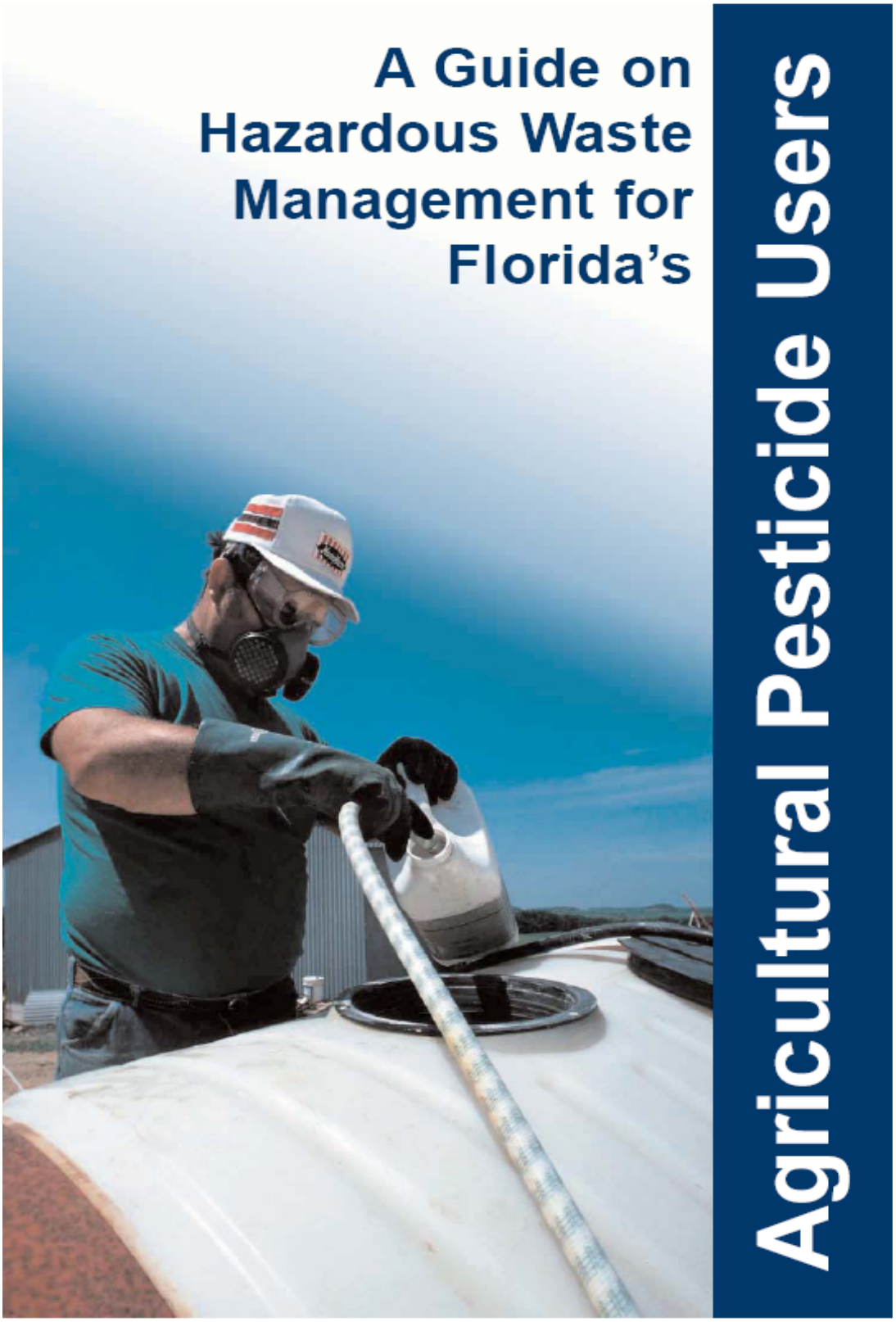
√ ***Get involved and stay involved.***

In other words, stay informed and become an active participant in the cleanup process. It is important to develop and maintain a good working relationship with the FDEP and the environmental consulting firm or cleanup contractor handling the cleanup. Do not hesitate to ask questions when you do not understand any aspect of the cleanup process. Seek clear explanations in layman's terms.

√ ***Seek the advice of your state and local environmental agencies.***

These agencies were created in part to protect and assist business and community members within their jurisdictions. Also, make sure schedules and standards agreed to by the FDEP are met.

Appendix R **A GUIDE on HAZARDOUS WASTE MANAGEMENT for FLORIDA'S AGRICULTURAL PESTICIDE USERS**



Florida Department of Environmental Protection Hazardous Waste Compliance Assistance Program

This document was published to help educate businesses on hazardous waste management issues affecting them. The suggested options may help businesses to operate in an environmentally appropriate manner. Some of the options may go beyond what is required to remain in compliance with regulations. Business owners are responsible for obtaining complete information about applicable regulations. Misrepresentations or omissions by the Florida Department of Environmental Protection or the Florida Center for Solid and Hazardous Waste Management do not relieve any person from any requirement of federal regulations or Florida law.

With Support From:

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Alan Bedwell, FDEP Deputy Secretary
John Ruddell, FDEP Waste Division Director
Bill Hinkley, FDEP Bureau Chief, Solid and Hazardous Waste Section
U.S. Environmental Protection Agency, Region IV

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Charles Emery, South District
Karen Bayly, South District

Cover photo courtesy of USDA Natural Resources Conservation Service.

Florida Center for Solid and Hazardous Waste Management
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John Schert, Executive Director
Marcia Marwede, Coordinator of Research Programs
Rhonda Rogers, Sr. Information Specialist
Kimberly Stenger, Technical Editor

These regulations are available at many public libraries. In addition, the Florida Department of Environmental Protection and the United States Environmental Protection Agency have posted links to copies of these regulations on the agencies' Internet sites:

http://www.dep.state.fl.us
http://www.epa.gov

These sites also provide access to agency forms, fact sheets, checklists, rule summaries, answers to frequently asked questions and reports from our public information databases. Individuals who do not have Internet access may obtain copies of department publications through the contact information listed on page 20-21 of this document.

Revised June 2003

Why should I care about hazardous wastes?

As a business owner, operator or employee, you may be producing materials that can harm people and the environment. This booklet offers helpful tips on how to:

- Comply with federal and state hazardous waste regulations.
- Avoid penalties by properly managing hazardous wastes.
- Save money on disposal costs by reducing hazardous wastes.

Health and Environment

Hazardous wastes spilled or dumped on the ground or disposed in dumpsters may seep into the groundwater and contaminate drinking water supplies.

Hazardous wastes may run off into the nearest body of water where they may poison or kill fish and other wildlife.

Hazardous wastes pose a risk to you, your employees and your community.

Cost Savings

State and county inspectors may visit your business to ensure that hazardous wastes are being managed properly. State penalties range from $100 to $50,000 **per violation per day**.

Reducing hazardous wastes can reduce your production and disposal costs and reduce your risk of future liability.

Public Image

Your customers will appreciate your efforts to prevent pollution.

Your community will recognize your business as a good neighbor.

What is a hazardous waste?

A waste is hazardous if:

- It is listed as a hazardous waste in the Title 40 Code of Federal Regulations (CFR) Part 261, Subpart D.
- It has any of the characteristics described below:

Characteristic Wastes

Ignitable

Ignitable wastes are flammable or spontaneously combustible. If they have a flashpoint of less than 140 degrees Fahrenheit or an alcohol content of 24% or more, they are hazardous wastes.

Corrosive

Corrosive wastes can burn the skin or corrode metals. Liquids with a pH of 2 or lower or 12.5 or higher are corrosive.

Reactive

Reactive wastes are unstable and may explode or react violently with water or other materials.

Toxic

Wastes are toxic if they contain certain heavy metals above specific concentrations, such as chromium, lead or cadmium, or toxic organic chemicals.

Listed Wastes

Some industrial processes and chemical wastes are listed specifically as hazardous in the federal regulations under 40 CFR 261, Subpart D. Copies of the rule can be found at many public libraries, on the internet (http://www.access.gpo.gov/nara/cfr/) or may be purchased from the Government Printing Office.

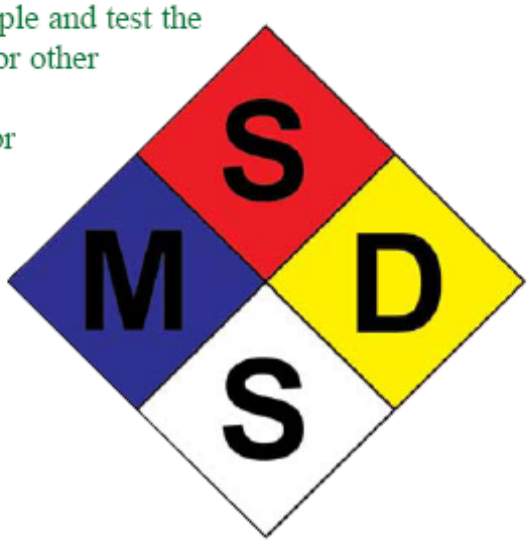
Acutely Hazardous Wastes

Small amounts of very dangerous wastes, such as arsenic and cyanide compounds, are regulated in the same way as large amounts of other wastes. A business that generates 2.2 pounds (1 kilogram) or more of these acutely hazardous wastes per month is subject to full regulation under the hazardous waste rules.

Identifying Your Hazardous Wastes

It is very important to determine whether a waste is hazardous or non-hazardous. There are several ways to identify hazardous wastes.

- Always ask for a Material Safety Data Sheet (MSDS) before ordering any new product. The MSDS will give you valuable information about the product. Note: the MSDS does not identify chemicals present in concentrations less than 1%, or 10,000 parts per million.
- Talk to product suppliers and manufacturers.
- Read product labels.
- Compare product and process information to hazardous waste characteristics and to wastes listed in federal regulations.
- If product or process information is not available or is inconclusive, have a commercial lab sample and test the waste using the TCLP test or other appropriate analytical tests.
- A non-hazardous material or product may become a hazardous waste due to contaminants added during use. Lab testing may be necessary.



Typical Hazardous Wastes

Pesticides regulated as hazardous wastes must be disposed properly, usually by a licensed hazardous waste contractor.

The following charts list **some** of the common pesticides that are regulated as hazardous wastes. The charts are reprinted from Proper Disposal of Pesticide Waste, a publication of the University of Florida, Florida Cooperative Extension Service, August 2000.

"Toxic" and "actuely toxic" hazardous wastes are subject to different disposal regulations.

Common Pesticides Regulated as Toxic Hazardous Wastes

Common Chemical Name	Trade Name
amitrole	Weedazol, others
cacodylic acid	Phytar, others
chlorobenzilate	Acaraben
chlordane	Chlordane, others
diallate	Avadex
DBCP	Nemagon, others
1,2-D	DD, others
1,3-D	Telone, Vorlex
2,4-D	Weedone, others
DDT	DDT
ethylene dibromide	EDB, Soilbrom, others
lindane	Isotox, others
maleic hydrazide	MH-30, others
methyl bromide	Brom-o-gas, others
methoxychlor	Marlate, others
pronamide	Kerb
thiram	Terson, others
warfarin (0.3% or less)	Coumadene, others
zinc phosphide (10% or less)	ZP, others

For information on applicable regulations, and for a **complete** listing of pesticides regulated as hazardous wastes, contact:
Florida Department of Agriculture and Consumer Services
Bureau of Pesticides
Phone: (850) 487-0532

Common Pesticides Regulated as Acutely Toxic Hazardous Wastes

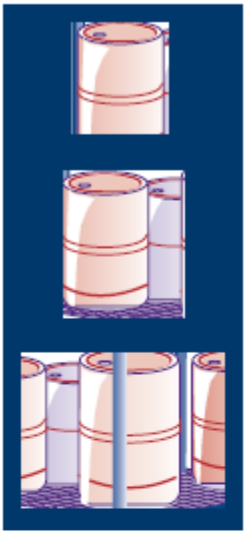
Common Chemical Name	Trade Name
aldicarb	Temik
aldrin	Aldrex, others
aluminum phosphide	Phostoxin
aminopyridine	Avitrol
dimethoate	Cygon, others
dinoseb	Dinitro, others
disulfoton	Di-syston
endosulfan	Thiodan
endothall	Aquathol, others
famphur	Warbex
heptachlor	Gold Crest H60, others
methomyl	Lannate, Nudrin
methyl parathion	Metaphos, others
parathion	Ethyl Parathion, others
phorate	Thimet
toxaphene	Toxakil, others
warfarin (more than 0.3%)	Coumafene
zinc phosphate (more than 10%)	ZP, others

Courtesy Clemson University

The Federal Insecticide, Fungicide and Rodenticide Act (FIFRA) regulates the distribution, use and sale of pesticides. FIFRA Section 12(a)(2)(G) makes it illegal to use pesticides in a manner inconsistent with their labeling. Your facility must comply with the requirements outlined by US EPA on each pesticide container label.

How should I manage hazardous wastes?

First, determine how much hazardous waste you generate **each month**. The rules you must follow depend on how much you generate, how much you store and how long you store it.



Less than 220 pounds (100 kilograms or about half a drum): you are a "Conditionally Exempt Small Quantity Generator" (CESQG).

220 - 2,200 pounds (100-1,000 kilograms or about half a drum to 5 drums): you are a "Small Quantity Generator" (SQG).

More than 2,200 pounds (1,000 kilograms or more than about 5 drums): you are a "Large Quantity Generator" (LQG).

The following practices may be required for your business. Even if they are not required, they are good waste management practices. Additional information is available from FDEP.

Containers

- Maintain containers in good condition. Prevent leaks, ruptures and accumulation of rainwater on tops of drums.
- If a container leaks, transfer waste to a new container.
- Keep containers closed. Use self-closing funnels when adding waste. Do not allow wastes to evaporate; this is a serious offense.
- Wastes must be compatible with the container. For example, use HDPE plastic containers for corrosive wastes.
- Never place incompatible wastes, such as wastes that react with each other (e.g., acids and bases) in the same container.

Storage

- Maintain adequate aisle space between container rows to allow inspection for leaks and damages.
- Store ignitable and reactive wastes at least 50 feet from property boundaries.
- Store containers with incompatible wastes in separate areas.
- Time limit for SQGs is 180 days. It is 90 days for LQGs.

Labels

HAZARDOUS WASTE
Federal Law Prohibits Improper Disposal
If found, please contact the nearest police, public safety authority or the US EPA

(Your business name, address and manifest document number)

- The above label represents proper wording for a hazardous waste label. You must also comply with FDOT.
- Label every container with the type of waste and whether it is hazardous or non-hazardous.
- Include the accumulation start date (the date when waste was first placed in the container).
- Include your business' name and address.
- Include federal waste code numbers.

Transport and Disposal

- Make sure your transport and disposal facility have US EPA identification numbers.
- Use manifests for all hazardous wastes shipped off-site. Keep the manifests on-site.

Inspections and Recordkeeping

- Inspect containers at least once a week and keep a written log of container inspections.
- Keep a record of larger spills and use this information to identify the spill prevention options that might help your business.
- Keep training and inspection records for three years.
- Keep manifests and shipping receipts for three years.
- Keep records of lab tests for three years.
- Keep land disposal restriction forms for three years from the date the waste was last shipped.

Training

- Train all personnel to identify, reduce and properly handle wastes.
- Train new employees before they handle hazardous wastes.
- Inform employees of the importance of pollution prevention.

How can I reduce hazardous wastes?

Reducing hazardous wastes makes good business sense. Benefits include:

- Saving money on waste management costs.
- Reducing concerns about penalties and liability.
- Creating a safer, healthier workplace.
- Promoting positive public relations with clients, customers and the local community.

How do I begin?

- Make a commitment to reducing wastes in all areas of your business.
- Follow instructions on pesticide labels to avoid having pesticides become hazardous wastes.
- Encourage the participation of all employees through education, training and incentives.

Integrated Pest Management (IPM)

With IPM, pesticides are only one of several methods used to control pests. IPM has many benefits, including:

- Fewer pests and more beneficial populations.
- Reduced pesticide costs.
- Reduced liability for hazardous wastes.
- Reduced potential for soil or water contamination.

Information on IPM is available from your county's Extension office.

Pesticide Storage

- Store pesticides in clearly labeled and segregated containers.
- Place bulk tanks in adequate secondary containment.
- Store pesticide containers off the ground in an area where there is no possibility of flooding.
- Store dry (granular) and liquid products separately, with dry products above liquids to prevent wetting from spills.
- Storage facilities should be dry and well-ventilated with proper fire protection equipment.
- Avoid storing pesticides that will not be used. When possible, return them to the manufacturer for relabeling or reprocessing.

Contact your county's Extension office for factors to consider in the design and modification of your storage facility.

Pesticide Selection and Handling

- Identify the specific pest to be controlled and choose the least toxic pesticide available.
- Purchase only the amount of pesticide needed for the immediate future.
- Read labels carefully to ensure proper and safe mixing, use and storage.
- Mix pesticides carefully, using only recommended amounts. Avoid mixing excess quantities.
- When pesticides must be mixed, conduct a compatibility test before adding pesticides to tanks. Follow label instructions.
- Inspect and calibrate spraying equipment frequently. Replace leaking hoses, fittings and nozzles.
- Clean up all spills and leaks immediately. Keep clean-up tools and supplies such as containment drums, kitty litter, shovel, broom and dustpan in storage areas.
- Spilled pesticides can be handled as a product, rather than a waste, if label instructions are followed.

Training

- Train new employees to use pesticides efficiently, using minimal amounts to get the job done.
- Ensure that employees follow label directions and precautions listed on Material Safety Data Sheets (MSDS).

Vehicle and Equipment Maintenance

- Reduce or eliminate solvent use by determining whether cleaning is necessary.
- Use a multi-purpose solvent to reduce the types of hazardous waste that need to be managed.
- Find less-hazardous substitutes for solvents, such as citrus-based, water-based or detergent-based cleaners.
- Keep used oil and other vehicle fluids segregated from solvent wastes and carburetor cleaner.
- Label waste containers clearly to prevent contamination of non-hazardous wastes.
- Contract with approved recycling services for used antifreeze, oil, lead-acid batteries and oil filters.

PREVENTING POLLUTION THROUGH PROPER MANAGEMENT

Rinsewaters

- Minimize rinsewaters by washing equipment only when necessary.
- Equipment rinsewater and empty container rinsewater may contain pesticides that would be regulated as hazardous waste if the rinsewater is not used as makeup water or applied as a pesticide.
- Rinsewaters can be collected for use at a later time to make a batch of the same or a compatible pesticide. Water containing pesticides is not a waste if it is used as a pesticide.
- Rinsewaters containing pesticides regulated as hazardous wastes should be used within 90 days. If stored longer than 90 days, FDEP must be notified and a permit is required.
- Use a hazardous waste disposal contractor for the treatment or disposal of unused rinsewaters containing hazardous pesticides.
- Rinsewaters should never be discharged to:
  - the ground
  - septic systems
  - ditches or streams
- Obtain written permission before discharging rinsewaters to a municipal wastewater treatment plant.
- Never store pesticide rinsewater in a sump. Sumps are similar to underground storage tanks, and leaks may occur.

Excess Product and Mixtures

- The best way to dispose of excess product is to find someone who can use it in accordance with the label.
- Contact the supplier or manufacturer to determine if excess product can be returned, or arrange for disposal with a hazardous waste contractor.
- Excess mixture that is left over in the spray tank should be used on a labeled site. It usually cannot be stored.
- Measure and calibrate carefully to avoid generating excess mixture.

Empty Containers and Liners

- Containers or liners that held pesticides listed as hazardous wastes must be empty before disposal.
- Triple-rinse containers with water only or power wash to remove the pesticide.
- After triple-rinsing or power washing, punch holes in the pesticide containers to prevent reuse. Store containers out of the weather, if possible.
- Follow directions on the label for container disposal.
- When available, recycle containers at a pesticide-container recycling facility.
- Purchase products from vendors that take back empty containers.

PREVENTING POLLUTION IN MIXING AND LOADING AREAS

Small but frequently repeated spills in mixing and loading areas can pollute ground waters, surface waters and soils.

Clean-up costs for pesticide contamination are astronomical and can bankrupt a business.

Typical causes of contamination in mixing-loading areas include:

- Leaking nozzles and hoses.
- Valves left open.
- Overflowing tanks.
- Frequent spilling of pesticides.
- Cleaning of spray equipment.

You can prevent soil and water contamination by:

- Preventing pesticide spills.
- Preventing repeated small spills in one location.
- Cleaning up any spill immediately.

Some ways to prevent spills include:

- Installing anti-siphon devices on wells or hydrants to prevent reverse flow of liquids into the water supply.
- Never putting a hose in a sprayer tank.
- Supervising sprayer filling.
- Using closed handling systems that transfer the pesticide directly from the storage container to applicator equipment.

Planning for a Mixing and Loading Site

Proper planning for a mixing and loading site is very important. A mixing and loading site that is not designed or constructed properly may require expensive reconstruction.

Before building, be familiar with available guidelines. To obtain a guidance document called "Natural Resources Conservation Service Interim Conservation Practice Standard Agrichemical Handling Facility," call the Department of Agriculture and Consumer Services, Bureau of Pesticides, at (850) 487-0532. The document is also available on FDEP's website: http://www.dep.state.fl.us.

Listed below are just a few of the important planning considerations:

- Locate the site as far as possible from unprotected groundwater wells and areas where runoff may carry spilled pesticides into surface water bodies.
- Use an impermeable surface for mixing and loading, such as concrete. Pesticide-resistant synthetics or steel also may be used.
- If an impermeable surface is not available, use random locations for mixing and loading to prevent the buildup of spilled materials in one place.
- A roof with an adequate overhang over a permanent mixing-loading slab prevents runoff of hazardous pesticides.
- Plant vegetation to provide a buffer zone between a mixing-loading area and sensitive areas, such as wells, groundwater recharge areas, sinkholes and surface waters.

Dos and Don'ts

DO
Keep containers closed

DON'T
Leave containers open

DO
Keep accurate inspection logs

DO
Label all containers

DON'T
Leave containers unlabeled

Who needs to know if my business generates hazardous waste?

Post Emergency Information

Post the following information near every telephone:

* Fire department phone number.
* Emergency coordinator's name and phone number.
* Locations of fire alarms and extinguishers.
* Locations of spill control materials.

Notify FDEP

If your business is a small or large quantity generator, notify FDEP to obtain a US EPA identification number. Local environmental agencies also should be notified.

Notify local authorities

Police and fire departments and local hospitals that would respond to an emergency need to know that there are hazardous wastes on your property.

Designate an emergency coordinator

This person must know what to do in case of fire, spill or other emergency and must be on the premises or on call 24 hours a day.

Develop a contingency plan

Guidance on contingency plans is available from FDEP. Large quantity generators must have a written plan that includes:

* Emergency response arrangements with police and fire departments, hospitals and emergency response contractors.
* Emergency coordinator's address and phone number.
* On-site emergency equipment descriptions and locations.
* Evacuation plan and routes, including a site diagram.
* Spill reporting procedures.

Smaller generators (SQGs and CESQGs) also should have a contingency plan.

Tips from Inspectors

Drums

- You cannot have any mystery drums. All drums must be labeled and have a "birthdate" on them.
- Evaporation of hazardous waste is a serious violation. Do not allow the hazardous wastes to evaporate. When you are not in the process of putting waste into the drum, you must keep it closed. You also are required to keep the top of the drum clean.
- Do not store old drums outside. If they get stormwater inside them, you will have to sample the stormwater and determine whether the water in the drum is hazardous. Insist that the person who sold you the drum and its contents takes the drum back when you are done with it.
- Inspectors go into dumpsters and walk the entire property line of a business. They go back into trees looking for orphan drums and distressed/dead vegetation.

Oil

- Used motor oil cannot be used for weed control. Used oil containers must not leak and must be in good condition.

Spills

- You must clean up your spills at the time of the spill.
- Be sure to store old automotive batteries on a floor that is under a roof. Do not stack batteries. If they fall over, they will leak acid and create a spill problem.

Transport

- The only generators who are allowed to transport their own waste are conditionally exempt small quantity generators. All other generators must use a hazardous waste hauler that has a permit from the FDEP and the US EPA.

Waste

- The most common violation is the non-determination of whether something is a waste.
- Abandoned products are wastes.
- If you throw away containers, make sure the container is completely empty and rinsed before you place it in a waste receptacle. If you throw away aerosol cans, make sure the can has a hole in it, and that you have drained the liquids out of the can. If you are throwing away paint containers, be sure to drain all the paint out of the container.

Water

- If you discharge any waste that could be construed as a hazardous waste into a city sewer, you must have the written permission of the city sewer system. The city sewer system must be a Publicly Owned Treatment Works (POTW). It cannot be a privately owned package plant.

Courtesy USDA NRCS

- If you use rags, you should send the rags to a linen service that is served by a publicly-owned sewage treatment plant. If you use paper towels, you must make a determination as to whether the used paper towels are a hazardous waste.
- Know where your drains go. All drains that lead from a hazardous materials area to a stormwater area should be sealed shut.

Where can I get more information?

Additional information on hazardous waste reduction and regulations is available from many sources.

Florida Department of Environmental Protection

District offices and the Tallahassee office offer technical assistance, fact sheets and other publications on hazardous waste regulations.

Hazardous Waste Compliance
Assistance Program
Phone: (800) 741-4DEP
(850) 245-8707
Fax: (850) 245-8810

Information about the
Universal Waste Rule can be found at:
http://www.dep.state.fl.us/waste/categories/mercury/pages/laws.htm
or by calling (800) 741-4DEP

Available publications include:
- Summary of Hazardous Waste Regulations
- Requirements for Conditionally Exempt Small Quantity Generators
- Requirements for Small Quantity Generators
- Handbook for Small Quantity Generators of Hazardous Waste

Bureau of Pesticides

For information and publications, call the Florida Department of Agriculture and Consumer Services, Bureau of Pesticides.

Phone: (850) 487-0532

Institute of Food and Agricultural Sciences (IFAS)

For information and publications, call the IFAS Pesticide Information Office at the University of Florida.

Phone: (352) 392-4721

Extension Offices

For the phone number of your county's Extension office, call the District Extension Directors Office:

Phone: (352) 392-1781

U.S. Environmental Protection Agency

The US EPA has published a series of industry-specific guidelines and handbooks on preventing pollution and complying with hazardous waste regulations.

RCRA Hotline: (800) 424-9346

Your Trade Associations

Many trade associations have published guides to help you find solutions to your hazardous waste management problems.

Florida Small Business Assistance Program

The Small Business Assistance Program helps businesses with environmental concerns and problems related to compliance with air regulations. Assistance is confidential and staff experts have business experience.

Phone: (800) 722-7457

Checklist

This checklist will help you prevent the most common hazardous waste violations. For more detailed information on hazardous waste management requirements, contact FDEP.

- ☐ Each month, identify and record types and quantities of hazardous waste.
- ☐ Notify FDEP and obtain a US EPA identification number.
- ☐ Use proper containers to collect and store wastes.
- ☐ Label all containers, whether product or waste, as to their contents.
- ☐ Include accumulation start dates on labels.
- ☐ Keep all containers of hazardous waste or products containing regulated solvents closed at all times unless actively removing from or adding to them.
- ☐ Maintain aisle space between containers for inspection.
- ☐ Inspect containers weekly for rust, leaks or damage and keep a log.
- ☐ Train employees to properly handle hazardous wastes.
- ☐ Designate an emergency coordinator.
- ☐ Post emergency information near each phone.
- ☐ Develop a contingency plan for emergencies.
- ☐ Use manifests for all waste transported for disposal.
- ☐ Keep all records for at least three years.

Offices of the Florida Department of Environmental Protection

Hazardous Waste Regulation Section
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, FL 32399-2400
(800) 741-4DEP

Northeast District
7825 Baymeadows Way, Suite 200B
Jacksonville, FL 32256
(904) 807-3300

Northwest District
160 Government Center
Pensacola, FL 32501
(850) 595-8300

Southwest District
3804 Coconut Palm Dr.
Tampa, FL 33619
(813) 744-6100

Central District
3319 Maguire Blvd.
Orlando, FL 32803
(407) 894-7555

South District
P.O. Box 2549
2295 Victoria Ave., Suite 364
Fort Myers, FL 33902-2549
(239) 332-6975

Southeast District
400 N. Congress Ave.
West Palm Beach, FL 33401
(561) 681-6600

This project and the preparation of this booklet were funded in part by a Section 3011 Hazardous Waste Management State Program grant from the U.S. Environmental Protection Agency (US EPA) through a contract with the Hazardous Waste Management Section of the Florida Department of Environmental Protection. The total cost of the project was $45,000, of which $45,000 or 100 percent was provided by the US EPA.

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Permit No. 94

For additional information contact:
Janet Ashwood
Florida Department of Environmental Protection
Hazardous Waste Compliance Assistance Program
Tallahassee, FL
Phone: (800) 741-4337
(850) 245-8707

Appendix S **GUIDE to BEST MANAGEMENT PRACTICES – 100% CLOSED-LOOP RECYLCE SYSTEMS at VEHICLE and OTHER EQUIPMENT WASH FACILITIES**

Guide to Best Management Practices

100% Closed-Loop Recycle Systems at Vehicle and Other Equipment Wash Facilities

Published by:
Florida Department of Environmental Protection
Pollution Prevention Program and
Industrial Wastewater Section

Florida Department of Environmental Protection
Industrial Waste Water Section and
Pollution Prevention Program
October 2005

This document was published as a guide only and it does not include all the applicable legal requirements. The document is intended to help owners and operators of vehicle and other equipment wash facilities using 100% closed-loop recycle systems understand applicable Department regulations. The document also offers recommendations for best management practices (BMPs) that make good business sense and at the same time protect the environment. Business owners are responsible for obtaining complete information about applicable regulations. The Department does not relieve any person from any requirements of federal regulations or Florida law though this guidebook. As this document is only a guidebook, facilities may find that some aspects contained in this publication may not be applicable in their case.

For use with Vehicle Wash Checklist Guide

This Guide was developed and published with support from:

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Guide to Best Management Practices for 100% Closed-Loop Recycle Systems at Vehicle and Other Equipment Wash Facilities

Introduction

This guide is addressed primarily to owners and operators of vehicle and other equipment wash facilities using 100% closed-loop recycle systems. Owners and operators of other types of non-recycling equipment wash facilities, including mobile wash units or pressure washers, should consult with the local office of the Florida Department of Environmental Protection (DEP) for regulatory requirements.

By design, facilities equipped with 100% closed-loop recycle systems should not discharge wastewater to ground or surface waters of the State. However, because of various conditions, discharges do occur at some facilities. These conditions include improper operating methods, inadequate maintenance, inappropriate storage, handling and disposal of materials, poor storm water management, leaks, runoff to the ground, or accidental discharges. Such discharges can cause significant contamination of the waters of the State. As a result, DEP may require an industrial wastewater permit for facilities equipped with 100% closed-loop recycle systems. **If these facilities implement successful Best Management Practices (BMPs) that prevent pollution and contamination of waters of the State, they may be exempt from obtaining such a permit, provided other Departmental requirements are met.**

This document contains guidelines for implementing BMPs at facilities operating 100% closed-loop recycle systems, briefly describes different options for managing the wastewater, and lays out basic regulatory requirements for the discharge of the wastewater. This guide is intended to serve as a tool and as a resource. When used as a tool, the owner and operators of vehicle and other equipment wash facilities can better understand applicable Department regulations; when used as a resource, the owner or operator may find and implement recommendations that make good business sense while protecting the environment. Other facilities, such as those utilizing partial recycle systems, may also benefit from implementing some of the BMPs described in this document, as appropriate.

Vehicle washing is the cleaning of privately owned vehicles (cars and trucks), public vehicles (school buses, vans, municipal buses, fire trucks, and utility vehicles), and industrial vehicles (moving vans or trucks, tractors, etc). Other equipment (airplanes, boats, tanks, wheeled tactical vehicles, farm equipment, trailers, construction equipment such as dozers, backhoe loaders, excavators, dump trucks, etc) is also being washed at some facilities. If not properly managed, the wash water can pollute the water supply and/ or surrounding water bodies. It can carry sediment and contaminants (for

example oil, grease, metal (paint chips), phosphates, detergents, soaps, cleaners, and other chemicals) to surface waters, or it can contaminate ground water by infiltration or by drainage to subsurface wells and septic systems. Once a water supply becomes contaminated, it is very difficult and costly to treat; moreover, the treatment process is not always successful.

The recommended way of managing the large amounts of wastewater resulting from vehicle and other equipment washing, is by recycling it through a system that purifies the wastewater and pipes it back for reuse. This results in water conservation as well as real savings to the vehicle wash facility in terms of water bills and sewer connection charges.

There are two types of recycling systems: 100% closed-loop recycle and partial recycle.

100% Closed-Loop Recycle System, also called a Non-Discharging/Closed-Loop Recycle System, is a total recycle system that recycles both wash water and rinse water with no discharge of wastewater to waters of the State.

A Partial Recycle System is a system where wash water is separated from the rinse water. The wash water is recycled, and the excess rinse water may be disposed of to an absorption field system designed and installed in accordance with Department requirements

1. 100% Closed-Loop Recycle Systems

100% closed-loop recycle systems are the preferred choice for many dischargers. These systems reduce or eliminate contaminated discharges to surface or ground water, or to Publicly Owned Treatment Works (POTWs). These systems require somewhat significant capital costs up front, for engineering, purchasing and installation of the equipment. However, water conservation, along with the additional monetary benefits of cost savings associated with lowered water bills and sewer connection fees make these systems a wise investment choice. Water conservation is achieved by piping the wash water through a purification system and reusing it. Therefore, there is no need to purify the wash water to meet drinking water or surface water quality standards. When the wash water reaches a certain level of contamination, it can be disposed of by using one of the alternatives discussed below.

Since the volume of wastewater to be disposed of is much less than in a non-recycling system, the cost associated with the discharge of the wastewater is also less. Some vehicle wash facilities report savings as high as 80% in water and sewer bills after implementing a recycle system. The length of time for a payback depends on local sewer and water rates, the purchase price of the recycling equipment, and the average number of vehicles being cleaned per day. Some facilities report a payback after just a couple of months, while others take as long as two years.

There are additional benefits resulting from the implementation of recycle systems. Due to severe droughts, water restrictions are becoming common. Recycling and reusing are extremely beneficial for the environment because of the savings of large quantities of water. In addition, the business is also provided with a sense of security, in that it can continue operating even under drought-imposed water restrictions. Some car washes are even using recycling as a marketing tool. In response to public awareness of the environmental issues, recycling is being presented as a way to save the environment, without giving up the luxury of a clean car.

100% closed-loop recycling can be accomplished by several methods, each with its advantages and disadvantages. Some recycling system designs incorporate the use of a small evaporator to burn off excess water regularly to allow the constant use of additional fresh water. Other recycling systems attempt to close the loop by creating rinse-quality water, which would eliminate the need for any new fresh water except to compensate for drive-off and evaporation. The important factor in all 100% closed-loop recycle systems is an awareness of the increased amount of maintenance and attention that will be needed to keep the system in balance.

As mentioned previously, 100% closed-loop recycle systems require periodic disposal of the wastewater. Two disposal options are available: discharge to a permitted Domestic Wastewater Treatment Facility, or contain and haul. Both options are discussed below.

A. Discharges to Domestic Wastewater Treatment Facility

The wastewater produced at a vehicle or other equipment washing facility may be discharged to a domestic wastewater facility (commonly referred to as a POTW). This method includes discharge into the collection system served by the POTW. Facilities should contact the POTW authority to determine the applicable fees and local permitting requirements that may include a pretreatment permit, before connecting to the system. The fee for the connection and discharge to the utility system varies depending on the volume of water discharged.

The POTW will inform the vehicle wash facility of any pretreatment requirements. A pretreatment method commonly required is separating the oil, water and suspended solids. This pretreatment method is typically performed in an oil-water separator outfitted with a grit-settling chamber. Other pretreatment methods may be required as well.

Oil-water separators cannot be used for treating water-soluble chemicals, such as anti-freeze and solvents, detergents that emulsify oil, or the emulsified oil itself. Oil-water separators require periodic servicing to maintain their

performance. Accumulated solids must be removed regularly from the bottom of the separator, as well as the oil floating at the top. The frequency of servicing depends on the size of the separator, and the volume and make-up of the wastewater flowing through it. Periodic inspections allow facility personnel to determine when the sludge must be pumped out and the oil removed. The oily waste generated by the oil-water separator generally can be sent off to a used oil recycler and managed as "used oil". Separator sludge must be sampled to determine if it is a hazardous waste, due to metals content. If the test results indicate the sludge is hazardous waste, the local DEP office should be contacted for information on handling and disposal methods.

B. Contain and Haul

Depending on the volume of wastewater produced, this option may require considerable storage, as well as high transportation costs to manage the wastewater and sludge produced. It is imperative to maintain accurate records indicating the name of the hauler, date, the amount of wastewater and sludge picked up, as well as the location of disposal. The wastewater should be disposed of at a pretreatment facility, a POTW, or other Department approved manner.

2. Partial Recycle Systems

Partial Recycle systems can be divided into two categories: limited recycling (pumping stations, etc.) and multi-stage filtration systems.

Limited recycling typically provides minimal filtration of water, offering approximately 50 to 80 percent wash water reuse depending on the technologies used. These systems are designed to remove the heavy solids and provide recycled wash-quality water for reuse. In some situations, oxidation may be necessary to control the odors and bacteria growth. This is usually achieved by the addition of a disinfecting system (using ozone, chlorine, etc).

Multi-stage filtration systems can provide 80 to 95 percent water reuse by incorporating the use of several water treatment technologies. The initial (first) stage is designed to settle out heavy solids while separating oils from the wash water. The majority of the filtration takes place in the second stage. This stage typically incorporates aeration, filtration and chlorination to ensure the removal of dirt, oils and waxes and to eliminate odors and organic buildup. The final stage consists of several methods which filter, polish and re-pressurize the water just prior to feeding the carwash equipment.

Partial recycle systems are designed to separate wash and rinse water, and recycle the wash water. The excess rinse water may be disposed of to an absorption field system. Wash water is prohibited from disposal on site and must be managed in a different way (i.e., contain and haul, or discharge to a POTW). Refer to section 4 of this guide for regulatory requirements for partial recycle systems.

3. Types of Facilities Using 100% Closed-Loop Recycle Systems

There are many different types of facilities utilizing 100% closed-loop recycle systems, such as:

A. Car wash: rollover, tunnel, wand
B. Heavy equipment wash
C. Boat cleaning
D. Other equipment wash

A. Car wash facilities

1. **Rollover car wash** is a car wash where the vehicle remains stationary while washing, rinsing, waxing and drying equipment passes over the car.

Figure 1. *Example of a rollover car wash. The wash water is well confined inside the system. Also, no significant amount of rainwater is introduced into the system.*

In-bay automatic car washes often use friction and/or pressure along with chemicals to achieve a good wash. Brush-type automatic car washes use 30 to 45 gallons of water per car, with a lower amount of chemicals. This water can be reused with minimum treatment. Touch-free automatic car washes consume a comparable amount of water per car, but require an increased amount of chemicals to achieve the same degree of cleaning. As a result, additional treatment steps are necessary before reusing the water.

2. **Tunnel car wash** is a car wash where the vehicle is pulled through a building by conveyor or other means, passing through separate washing,

rinsing, waxing, and drying areas.

Figures 2, 3 and 4. *Examples of a tunnel car wash.*

Tunnels can wash from 100 to 1,000 cars a day, using an average of 80 gallons of water per car. This high water volume lends itself well to water recycling, since the water collection can be segregated in the trenches to permit separate treatment and reuse of wash and rinse water.

3. **Wand car wash** is a self-service car wash where the vehicle remains stationary and the car is washed using a high-pressure stream of water from a hand-held wand.

Figure 5. *View of a wand car wash.*

On the average, a self-serve facility uses 20 gallons of water per vehicle with 3-5 gallons of water loss through evaporation and carryout. Although the number of cars per day is relatively low, because of the variety of vehicles and equipment passing through the bays, the wastewater is heavily contaminated and it must go through a higher degree of treatment before reuse.

All facilities that provide wax, add drying agents or other additives, or have water softening equipment, should install a total recycle system that recycles both wash water and rinse water, with no discharge of wastewater to waters of the State. As discussed above, when needed, the wastewater can be pumped out and hauled to a pretreatment facility or to a POTW.

B. Trucks and Heavy Equipment Facilities Using 100% Closed-loop Recycle Systems

Facilities washing trucks and other heavy equipment will require larger wash pads than the typical car wash facility. The amount of water needed for each cleaning cycle is higher (up to several hundreds of gallons) and so is the amount of cleaning agent needed. Large vehicles can carry significant amounts of dust, sand, soil, gravel and other large particles. Removal of

these larger particles can be enhanced by mounting a series of weirs within the drain trench, normally along the center of the wash bay. The loss of water through carry out is high. For example, a tractor-trailer can carry out of the wash bay up to 40-50 gallons of water on the vehicle and on top of the trailer. The options for containing and recycling the wash water can vary as depicted in the pictures below.

Figure 6. *Truck wash facility, with open, roofed structure. The berm prevents the wastewater from running off the wash pad.*

Figure 7. *Covered concrete wash pad. Wastewater collects into the adjacent pit via the gate.*

Figure 8. *Example of heavy equipment washing facility equipped with a 100% closed-loop recycle system.*

C. Marinas and Boatyards

Pressure washers may be used to remove barnacles and marine life from boats. The wastewater generated from pressure washing must be contained and directed to a recycling system, or to a POTW. For detailed information on BMPs for boat cleaning visit Florida's Clean Marina Program at http://www.dep.state.fl.us/law/Grants/CMP/default.htm.

D. Other Equipment Wash

The 100% closed-loop recycle system is often used at a variety of other facilities. Such facilities may wash small aircraft, heavy equipment, and military vehicles. Significant savings in water usage as a result of installing the closed-loop recycle systems are reported.

4. Regulatory Requirements

There are many factors that determine the need for a wastewater permit from the Department. The regulatory requirements for these types of systems are discussed below.

A. General Permit

There is a General Permit (GP) for Car Wash Systems available under the Industrial Wastewater Program pursuant to Rule 62-660.803, Florida Administrative Code (F.A.C.). The GP is valid for 100% as well as partial recycle Car Wash Systems that meet the requirements established in the rule. However, it is not applicable to truck or heavy equipment wash facilities.

Under this rule, spent process water must be disposed of at a Department-permitted wastewater treatment facility or a pretreatment facility connected to a Department-permitted wastewater treatment facility. Small residential car washes that meet the exemption criteria of Rule 62-660.803(1)(b), F.A.C., are not required to obtain coverage under the GP or an Individual Industrial Wastewater Permit.

B. Individual Industrial Wastewater Permit

Facilities that do not qualify for coverage under the GP may be required to obtain an Individual Industrial Wastewater Permit. However, facilities may seek an exemption from permitting and should provide the Department with a description of and information regarding the processes involved including the type of operation, location, site specific BMPs and justification supporting their request for an exemption. To grant an exemption, the Department staff must make a determination that the facility has provided reasonable assurance that water quality standards will be met, thereby protecting Florida's natural resources.

Note: Before applying for an industrial wastewater permit, you are encouraged to contact the Industrial Wastewater Section of your local DEP District Office (http://www.dep.state.fl.us/water/wastewater/iw/contacts.htm) to ensure that the proper permit, if required, is obtained.

C. Discharges to Municipal Separate Storm Sewer System (MS4)

A Municipal Separate Storm Sewer System (MS4) is a public-owned conveyance or system of conveyances (i.e., ditches curbs, catch basins, underground pipes, etc.) that is designed for the discharge of stormwater to surface waters of the State. Water from individual residential car washing can be discharged to a MS4. The discharge of industrial wastewater from car washing is not authorized by MS4 permits. However, some MS4s require Best Management Practices (BMPs) at their municipal fleet and or equipment maintenance facilities. Please contact the MS4 authority in your area for additional information.

5. Developing BMP Guidelines

Each facility operating a 100% closed-loop recycle system should develop a BMP plan. The BMP plan is a documented step-by-step process for ensuring that pollutants from the facility are not discharged from the site and thus potentially adversely affecting the quality of waters of the State. BMPs should include schedules of activities, recommended practices to help operate the recycle system in the best possible manner, practices to avoid, maintenance procedures, and other management practices to prevent runoff from the site.

The guidelines discussed in this document are designed to assist the owners and operators of 100% closed-loop recycle systems in developing a BMP plan. It must be noted that these are general guidelines and should be tailored by each individual facility according to their specific conditions. The manufacturer's instructions and the operator's manual should be closely followed in preparing site-specific BMPs, as well as during operations.

Several important elements needed for developing a good BMP plan include: site assessment, good housekeeping, preventive maintenance, visual inspections, record keeping and reporting, and employee training.

Site assessment

The first step in developing a BMP plan involves conducting an assessment to identify the sources of pollution. This may include taking a look at the facility to determine what materials and practices are (or may be) a possible source of contamination; conducting a material inventory and recording the types of material stored, handled, or processed at the facility (i.e. gasoline, paints, solvents, etc.); evaluating past spills and leaks, etc. After conducting the assessment, the BMPs discussed below may be used, making sure that any other items specific to each individual operation are also included.

Good housekeeping

This means keeping a safe, orderly, and clean work environment. Some ways of doing this include: improving operation and maintenance of machinery and process; implementing careful storage practices; keeping a current, up to date inventory; properly labeling all containers; scheduling routine clean-up operations; training employees on good housekeeping techniques, etc.

Preventive maintenance

A program must be developed that insures regular inspections and routine maintenance of the equipment, including pipes, pumps, storage tanks, drums, containers, and all other facility operations. This will help maintain the equipment and structures in good condition, and will in turn, prevent pollution of the waters.

Visual inspections

Conduct regular inspections on site, making sure all BMPs are followed, and record any problems that require correction (i.e. runoff offsite, housekeeping, foul smell, leaks, improper material storage, etc).

Record keeping and reporting

Record all spills, leaks, inspections, and maintenance activities. Date, times, weather conditions, causes, and resulting problems should also be noted. Keep all pertinent records on site.

Employee training

A training program should be developed, covering such topics as spill prevention and response, good housekeeping and material management practices (including the use of MSDS and using personal protective equipment (PPE) as needed). The goal of the training should be to teach all personnel good operational practices, safety, methods of pollution prevention, and create an awareness of the environmental concerns.

BMP Guidelines

Wash Site

The wash site must be designed with proper curbing and sloping to ensure that neither stormwater nor wastewater will pond at the site, flood the adjacent property, or create nuisance conditions (severe odors, etc).

Figure 9. *The rinse water at this car wash facility is allowed to collect on site, creating nuisance conditions.*

Wash areas should be located on well constructed and maintained impervious surfaces, with drains piped to the disposal devices. The wash area should extend at least four feet on all sides of the vehicle to trap all overspray.

Figure 10. *The wash area at this facility is large enough to accommodate the size of the heavy equipment being cleaned. However, this unit is placed too close to the edge of the wash area, allowing wash water to run off the pad.*

It is recommended to enclose the washing areas with walls to prevent the dirty overspray from leaving the area. Also, the floors should be properly graded to allow the wash water to drain into the collection pit or sump.

Figure 11. *The gap between the overspray abatement curtains and the curb at this car wash facility allows wash water to escape outside the impervious area.*

Figure 12. *Outside view of the same facility. Because of the improper containment, the wash water runs outside, off premises, and onto the ground.*

Washing areas should not be located near uncovered vehicle repair areas or chemical storage facilities, to prevent the transport of chemicals in the wash water runoff.

Warning signs should be posted for customers and employees not to dump vehicle fluids (such as oil or engine coolant), pesticides, solvents, fertilizers, organic chemicals or toxic chemicals into the drain or collection sump. No engine degreasing solvents shall be used at the facility. All signs should be displayed in a visible location and should be easy to read. Facilities should stencil warnings on the pavement next to the drain or collection sumps. This is especially important for the self-service car wash facilities, where an attendant is not usually on site and as a result individuals may tend to wash their engines or undercarriages using degreasers, wash the exterior of their vehicles with chemicals other than common soap solutions, or may pour used oil, antifreeze, or other hazardous materials down the drains. Such practices are not acceptable.

Oil

Materials such as absorbent pads should be available for use if an oily sheen appears. Used oil should be stored in compatible tanks which are in good condition and labeled with the words "Used Oil." The tanks should be stored in an area with an impervious floor, drip pans and curbed spill containment, adequate for the volumes stored. Any used oil from the oil-water separators should be managed by a used oil recycler registered with the Department, in accordance with Chapter 62-710, F.A.C. For information regarding the management of used oil, or to contact the used oil coordinator, visit the used oil program web page at: http://www.dep.state.fl.us/waste/categories/used_oil/default.htm

Wastewater

A recycle system that recycles both wash water and rinse water, with no discharge of wastewater to waters of the State or to a POTW, should be considered. In any event, wastewater should be disposed of at a permitted wastewater treatment facility, a pretreatment facility connected to a permitted wastewater treatment facility, or other Department approved manner. Please refer to section 4 of this guide for details on regulatory requirements.

When problems occur (i.e., an unanticipated bypass, upsets in the system, an unauthorized discharge to surface or ground waters), DEP or the POTW authority, if the discharge is to a permitted wastewater treatment facility, should be notified. For unauthorized releases or spills of untreated or treated wastewater that are in excess of 1,000 gallons per incident, or where information indicates that public health or the environment will be endangered, oral reports shall be provided to DEP by calling the STATE WARNING POINT TOLL FREE NUMBER (800) 320-0519, as soon as practical, but no later than 24 hours from the time the facility becomes aware of the discharge. A detailed written report (describing the problem, remedial measures taken, and steps implemented to prevent the problem from happening again) may also be required at a later stage.

Figure 13. *Example of a 100% closed-loop recycle treatment unit installed in an enclosed space to prevent rainwater from getting in, as well as, to prevent unwanted tampering with the control panel.*

Do not pre-wash, wash, or rinse vehicles outside or away from the wash area, to prevent wash water discharge to the ground or surface waters.

Figure 14. *Dirty water in this puddle just outside the car wash tunnel indicates some car washing took place outside the wash tunnel, allowing dirty water to run onto the ground instead of into the collection pit.*

Stormwater

Do not allow intrusion of stormwater into the recycle system. Install overhangs, roofing, or other devices on buildings. Also, install curbs around wash bays or tunnel entrances (or elevate bays or tunnels) as appropriate. This will avoid the overloading of the system's storage capacity, and the potential to cause a discharge.

Figure 15. *The collection pit at this car wash facility is located outside, adjacent to the wash tunnel. The pit is not covered, there is no overhang, and the downspout brings rain water right into the pit. This situation must be corrected.*

Figure 18. *The wash pad at this facility is equipped with a stormwater diversion valve.*

If the system is equipped with a stormwater diversion valve, the following procedures must be followed to insure proper results:

- The wash pad must be cleaned with fresh makeup water after each day of use to prevent stormwater contamination.
- The rain diverter valve must be in the proper position (according with the operation procedures) before starting the wash operations.
- Discharge of solids is not allowed.
- The discharge of uncontaminated stormwater must not cause a visible sheen.

Solids

Prior to disposal, separator sludge must be sampled to determine if it is a hazardous waste. (See section I.A. of this document for more information.) Sludge and solids from sedimentation tanks, centrifugal separator, used filter material, and other solid wastes, that are not hazardous, must be disposed of at a Class I or Class II lined, solid waste landfill authorized by the Department to accept solid wastes under Chapter 62-701, F.A.C. A record of the quantity of waste sludge disposed, contract hauler, disposal location, and disposal date for the sludge must be maintained.

Sludges and sediments from the oil section of the oil-water separator can be managed by the used oil handler as an "oily waste" such that both used oil and such sludges can be handled at the same time by one handler. This can also apply to drip pads and sorbent materials used to clean up releases of used oil.

Settled solids must be frequently removed, to prevent drains from clogging, or sumps from overflowing. Used filters and other solid waste must be stored

in covered containers until ready to be sent to a landfill.

Figure 19. *The solid waste collected from the settling pit is improperly stored in an open bucket. The waste should be stored in a closed container until ready to be sent to a class I or II sanitary landfill.*

If it is not practical to store material awaiting disposal in closed containers, the material should be well covered with a tarp to prevent stormwater contamination.

Figure 20. *Example of improper storage of solids. The material is not completely covered and as a result, the rain water can wash it away.*

Figure 21. *Example of improper handling/storage of solids. An attempt was made to cover the pile with a tarp; however the coverage is not complete, so the rain water can wash and carry away solids from the pile.*

Figure 22. *Example of improper handling of solids. Solids should be stored on an impervious surface, well covered, with no exposure to rain.*

Storage

Reusable or recyclable materials should be used whenever possible. The number of different products used should be reduced in order to reduce inventory, incompatibilities, and disposal problems. Purchasing larger quantities than will be used within their shelf life and rotating stock should be avoided.

Materials should be stored securely, tightly covered, and clearly labeled. Spare empty containers should be kept on hand to store materials from leaking or damaged containers. Material Safety Data Sheets (MSDSs) should be

available for all materials handled at the facility. Every employee should know the location of the MSDSs, and how to use them. Absorbents should be kept on hand for spill clean up. A spill containment and clean up program should be implemented.

If heavy equipment is stored at the facility, the dirty portions of the equipment should be covered when not in use, to control runoff contamination.

Figure 23. *At this facility heavy equipment is completely covered for protection from the inclement weather, and also to prevent runoff contamination. If a roofed structure is not feasible, at least the dirty portions of the equipment should be covered.*

Operations

The principle of water recovery is based on removing suspended and dissolved solids. Suspended solids can be removed through settling tanks, hydrocyclones (for larger particles), and centrifuges and filters (for smaller particles). Settling tanks are usually designed with sloped bottoms for easy sludge removal. The sludge needs to be removed at regular intervals by pumpout truck, or by a sludge pump incorporated into the system.

Figure 24. *Pumpout truck used to remove the sludge from the settling tank at this facility.*

Plate and frame filters, pressure sand filters, mixed media filters, and pressure leaf filters can be used in car wash operations for final rinse water treatment. Particles larger than 40 microns must be removed from the recycled water to prevent equipment wear and abrasions on car finishes.

Dissolved solids (mainly chlorides) are more difficult to remove. Removal can be accomplished via ion exchange, reverse osmosis, absorption, electrolysis, etc. Dissolved solids must be less than 500 mg/l to avoid spotting. Water with a higher content of dissolved solids will leave stains on the car upon drying. This is why many car wash facilities prefer to use fresh water for rinsing. The final fresh water rinse serves the double purpose of providing high quality wash as well as providing the necessary make-up water that is lost within the system. There is an unavoidable loss of water from the system (about 3-5 gallons of water per car wash) due to drag out on the washed cars, and use within the system (i.e. evaporation, etc.).

There are several BMPs to be observed during operations of the equipment:

- The recycle equipment (such as sedimentation tanks, oil-water separators, filtration units, evaporators, pumps, etc.), should have adequate capacity to handle maximum hourly flows based on expected usage and the size of the facility.
- Washing operations should be performed such that all wastewater is directed into the treatment system, with no leaks or spills outside the wash pad and onto the ground.
- To prevent foul odors due to decomposing of organic matter by bacteria, a chlorination system should be installed. Other disinfecting methods are also available on the market such as: hydrogen peroxide, bromine, ozone, catalytic oxidation (UV and ozone), and a combination of catalytic oxidation with hydrogen peroxide. Some manufacturers of disinfecting systems

recommend catalytic oxidation (UV and ozone) as the most effective combination to be used.

- Regular inspections and maintenance of the disinfecting system should be performed to help prevent odors from developing. If repeated attempts to reduce smell or to clear up the recycled water fail to improve the water quality, or if an extremely large amount of soap is needed to clean the vehicle properly, the water likely contains too many dissolved and suspended solids and needs to be replaced. The system should then be drained and the spent wastewater should be disposed of according to local, state, and federal regulations.
- The recycle equipment should be maintained in accordance with the manufacturers' recommendations, to ensure proper operation.
- The operator's manual must be kept handy, for easy reference.
- A regular maintenance schedule must be kept and each activity should be logged.
- The recycle system must be inspected regularly, and any leaks must be repaired.

Figure 25. *The recycling system at this facility is enclosed and it is therefore protected from stormwater intrusion. The liquid on the floor indicates a spill or leak. This situation must be corrected.*

- The circulation in the recycle system must be maintained when not in use, to prevent foul odors and clogging caused by sedimentation.
- The operation of the 100% closed-loop recycle system should be under the supervision of a person who has formal training or practical experience in the field of water pollution control.
- A reduced pressure zone backflow preventer or an equivalent device must be installed on the water supply line from the water system to the wash facility if a drinking water source is used as the makeup water source for the facility.

- The soap/detergent used must be of neutral pH, break down quickly (biodegradable), and must be used sparingly. Some cleaning agents may cause oils to emulsify. When this happens, the oils cannot be removed through treatment and end up right back on the equipment. This is why the cleaning agents used in the system should produce low or moderate foaming and have less emulsifying properties while remaining pH neutral. Some soaps designed for closed-loop recycle systems also prevent bacteria and algae growth, inhibit corrosion, and help flocculate oil accumulation. They contain no dyes, perfumes or thickeners.
- Housekeeping activities must be performed since they are important in insuring proper operation of the facility.

Figure 26. *Scattered pieces of different materials in a puddle of liquid on the floor are signs of poor housekeeping. Poor housekeeping creates safety hazards, as well as operational problems.*

- Water conditioners on the market may be used as additives to the 100% closed-loop recycle system. These conditioners help maintain a good water quality, help in releasing and flocculating of suspended solids, help soften the water, inhibit corrosion on the system, and lower the total suspended solids (TSS) count which improves the color and quality of the recycled water. It has to be noted, however, that while the additives can have a positive effect on some water qualities, at the same time their use increases the Total Dissolved Solids (TDS), which is a negative effect.

Figure 27. *Example of good housekeeping.*

Maintenance

Preventive maintenance must be practiced according to the operations manual provided by the manufacturer of the recycle system. The following are some examples for setting a regular maintenance schedule. (The schedule will vary according to the specific recycle unit and other conditions existing at each facility. Manufacturer's recommendations should be used when setting up the maintenance schedule):

Daily

- Flush solids from the system.
- Remove any floating debris or scum from the surface of the tanks.
- Drain off oil from the oil/water separator.
- Wipe any accumulated scum from the oil skimmer(s). Check the operation of the oil skimmer(s) while the system is flowing and if necessary, adjust the skimmer(s).
- Check the system while running, record pressure gauge readings; check the status of indicator lights, meters, and chemical injection pumps; check the water levels.
- Check the filter gauges, manually clean filters and back flush if necessary.
- Check the chemical system; verify the setting on the output; check the level in the chemical container, and refill as needed. Record the amount of chemicals used in the 24-hr period.

Weekly

- Check the trenches, sumps, pits, and clarifiers for sediment level. Dig out and properly dispose of the sediment.

- Clean the system, back-flush multi-media tanks and repair leaks.
- Clean or replace cartridge filters.
- Briefly drain the storage tank to remove accumulated solids at the bottom of the tank.
- Remove any accumulated debris or scum from the surface of the water.

Monthly

- Check the Hydrocarbon absorber for oil and solids loading. Replace if necessary.
- Clean the UV catalytic chamber.

Twice a year or as needed

- Drain the tank, remove filters to clean or replace.
- Clean or replace multi – media bed.
- Clean membranes.
- Clean valves.

General Safety Issues

- Follow all manufacturer's instructions, procedures, cautions, and warnings when operating the recycle system.
- Follow all OSHA guidelines while performing the operations required.
- Place all material safety data sheets (MSDSs) in a known location, with easy access for all employees.
- Use appropriate personal protection equipment (PPE) when handling chemicals and when operating the system.
- Make sure all work areas are well ventilated.
- Do not add excessive amounts of chemicals to the recycle system.
- If using an UV light for disinfecting, do not look at the UV light in the chamber Permanent damage or burns to eyes or skin may result.
- Make sure all employees using the recycle system are trained in operating the system according to the manufacturer's instructions, and that they know how to handle leaks and spills, and how to dispose of used oil, other liquids, and solid waste.
- Provide employee training. It is an important tool to prevent vehicle and other equipment wash water from entering stormwater drains, and injection wells and contaminating source waters. Employees should be aware not only of the operation and maintenance procedures and general housekeeping rules, but also of any toxic chemicals with which they may come in contact. They also need to have access to a chemical management plan and an emergency contact list (if applicable).
- Plan and design spill prevention and control management at all designated washing areas, to prevent any spills of pollutants from entering surface

water, ground water, or a publicly or privately owned treatment works.

- Implement a chemical management plan at closed-loop recycle facilities that use metal brighteners, caustics or acids, hallogenated hydrocarbons, or solvents. The plan should include a list of the chemicals used, the method of disposal (such as reclamation or contract hauling), and procedures for assuring that toxic chemicals are not discharged into source water. The plan should also provide procedures for preparedness and response to emergency situations including fire, spills, hurricane and other severe weather conditions. Personnel must be trained on procedures to prepare for and respond to an emergency. The contact persons and their telephone numbers should be readily available.

Onsite pollution prevention assessments should be considered in identifying optimal source reduction technologies and processes. Information regarding the Pollution Prevention (P2) program can be obtained through their website: http://www.dep.state.fl.us/waste/categories/p2/default.htm. The Pollution Prevention Program is available to provide technical assistance for development and implementation of a Vehicle Wash BMP plan.

Glossary of terms

Best Management Practices (BMPs) means schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters. BMPs also include treatment requirements, operating procedures, and practices to control plant site runoff, spillage or leaks, residuals, industrial sludge or waste disposal, or drainage from raw material storage.

BPJ means Best Professional Judgement.

Chemical Flocculation is the addition of a chemical coagulant or flocculent to improve the settling characteristics of suspended solids.

Conventional Pollutants means five day biochemical oxygen demand (BOD5), total suspended solids (TSS), pH, oil and grease, and fecal coliforms.

Department means the State of Florida Department of Environmental Protection.

Ground water means water below the land surface in the zone of saturation where water is at or above atmospheric pressure.

Industrial sludge means the accumulated solids, residues, and precipitates generated as a result of industrial wastewater treatment.

Industrial wastewater means process and non-process wastewater from manufacturing, commercial, mining, and silvicultural facilities or activities, including the runoff and leachate from areas that receive pollutants associated with industrial or commercial storage, handling or processing, and all other wastewater not otherwise defined as domestic wastewater.

Non-process wastewater means water that does not come into direct contact with or does not result from the production or use of any raw material, intermediate product, finished product, by-product, waste product or

wastewater. It includes sanitary wastes, restaurant or cafeteria wastes, and non-contact cooling water used only to reduce temperature.

Oily wastes means those materials which are mixed with used oil and have become separated from that used oil. Oily wastes also means materials, including wastewater, centrifuge solids, filter residues or sludge, bottom sediments, tank bottoms, and sorbents which have come into contact with, and have been contaminated by, used oil.

Percolation means the generally vertical movement of water through soil or other unconsolidated medium to the water table and to lower aquifers where occurring.

pH is a measure of the hydrogen ion concentration of water or wastewater (expressed as the negative log of the hydrogen ion concentration in mg/l). A pH of 7 is neutral. A pH less than 7 is acidic, and a pH greater than 7 is alkaline (or basic).

Process Wastewater means any water, which during manufacturing or processing comes into direct contact with or results from the production or use of any raw material, intermediate product, finished product, by- product, and other waste product.

Publicly owned treatment works (POTW) means any device or system used in the treatment, including recycling and reclamation, of domestic sewage or industrial wastes of a liquid nature which is owned by the State, a county, or a municipality. This definition includes sewers, pipes, or other conveyances only if they convey wastewater to a POTW providing treatment.

Residential car wash means any facility located in a single-family or multi-family housing development, which is designed specifically for the purpose of vehicle washing.

Rinse water for car wash recycle systems means the treated or fresh water sprayed on the car after washing.

Rollover car wash means a car wash where the vehicle remains stationary while washing, rinsing, waxing and drying equipment passes over the car.

Spent process water for car wash recycle systems means the water contained in the system (tanks, pumps and piping) that is no longer suitable for use, because of long term build up of salts or other contaminants.

Stormwater is stormwater runoff, surface runoff, and drainage.

Surface water means water upon the surface of the earth, whether contained in bounds created naturally or artificially or diffused. Water from natural springs shall be classified as surface water when it exits from the spring onto the earth's surface.

Total Dissolved Solids (TDS) represents the total material actually dissolved in the water that can be measured by electric current.

Total Suspended Solids (TSS) represents total amount of particles floating in a liquid, large enough to be seen by human eye, but too small to settle down.

Treatment means the use of any device, system, process or method for preventing, abating, reducing, treating, separating, recycling, reclaiming, reusing, recovering, or eliminating pollutants in industrial waste.

Tunnel car wash means a car wash where the vehicle is pulled through a

building by conveyor or other means, passing through separate washing, rinsing, waxing, and drying areas.

Upset means an exceptional incident in which there is unintentional and temporary noncompliance with technology-based effluent limitations because of factors beyond the reasonable control of the permittee.

a) An upset does not include noncompliance caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, careless or improper operation.

b) An upset constitutes an affirmative defense to an action brought for noncompliance with technology based permit effluent limitations if the requirements of upset provisions of Rule 62-620.610, F.A.C., are met.

Wand car wash means a self-service car wash where the vehicle remains stationary and the car is washed using a high pressure stream of water from a hand-held wand.

Wash area means the impervious surface specially designed to collect wastewater.

Wash water for car wash recycle systems means the water containing detergent used to remove dirt from the car.

Wastewater means the combination of liquid and water-carried pollutants from residences, commercial buildings, industrial plants, and institutions together with any ground water, surface runoff, or leachate that may be present.

Florida Department of Environmental Protection

Resources

This Guidebook was developed and published by the Florida Department of Environmental Protection (DEP) Pollution Prevention Program in partnership with the DEP Industrial Wastewater Section and was funded in part by a grant from the US Environmental Protection Agency (EPA).

The Florida Pollution Prevention (P2) Program provides non-regulatory technical assistance in pollution prevention to both the public and private sectors. Pollution prevention (P2) is a management tool that seeks to reduce the generation of waste or pollution while increasing the efficient and sustainable use of resources. P2 is accomplished through source reduction, waste minimization, or on-site recycling. DEP P2 Program provides non regulatory on-site P2 assessments and individual consultations at no cost to your organization. For help with the development and implementation of a Best Management Practices (BMP) Plan or for any questions concerning pollution prevention projects, you may contact the Tallahassee P2 Program, or one of the District P2 Coordinators. Visit the Pollution prevention web site at http://www.dep.state.fl.us/waste/categories/p2/default.htm and click on Contacts, or call the Tallahassee Pollution Prevention Office at (850) 245-8715.

Information on the DEP Industrial Wastewater program can be found by visiting: http://www.dep.state.fl.us/water/wastewater/iw/index.htm

Specific questions regarding permitting should be directed to the appropriate district office as listed in this Guide or by visiting the following site: http://www.dep.state.fl.us/water/wastewater/iw/contacts.htm

Additional information on managing vehicle washing facilities in an environmentally friendly manner is offered by the EPA at: http://www.epa.gov/safewater/protect/pdfs/vehicle.pdf

Florida Department of Environmental Protection (FDEP)

Industrial Wastewater Section District Offices

Northwest District
160 Government Center
Pensacola, Florida 32501-5794
(850) 595-8380

Southwest District
3804 Coconut Palm Drive
Tampa, Florida 33619-1352
(813) 744-6100

South District
(PO Box 2549)
2295 Victoria Avenue, Suite 364
Fort Myers, Florida 33902-2549
(239) 332-6975

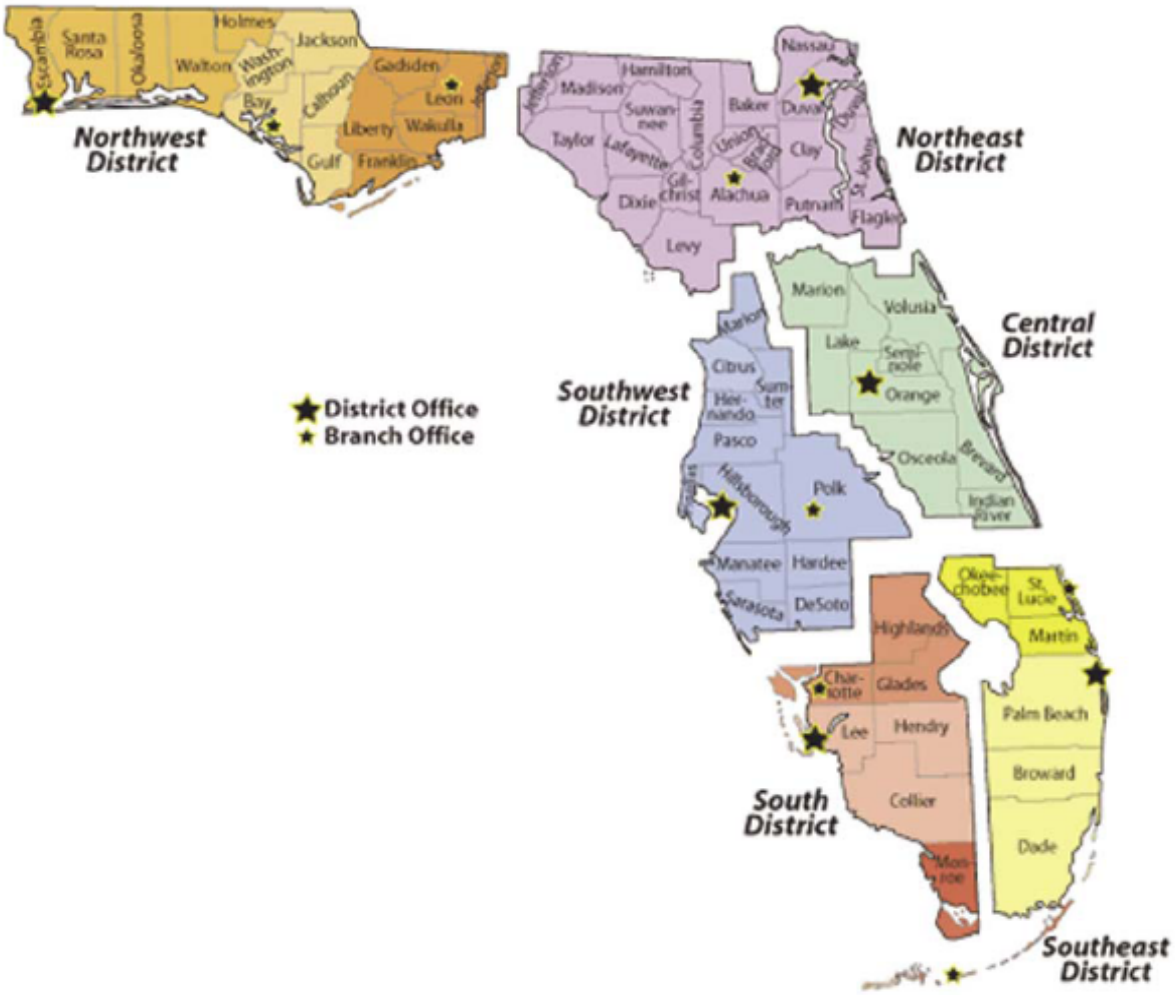
Northeast District
7825 Baymeadows Way, Suite 200B
Jacksonville, Florida 32256-7590
(904) 807-3300

Central District
3319 Maguire Boulevard, Suite 232
Orlando, Florida 32803-3767
(407) 893-3314

Southeast District
400 North Congress Avenue Ste 200
West Palm Beach, Florida 33401
(561) 681-6600

Florida Department of Environmental Protection (FDEP)

District Offices



FDEP Industrial Wastewater Section

2600 Blairstone MS 3545
Tallahassee, FL 32399
Phone (850)245-8589

http://www.dep.state.fl.us/water/wastewater/iw/index.htm

Appendix T **RECOMMENDED BEST MANAGEMENT PRACTICES for MOBILE VEHICLE and EQUIPMENT WASHING**

Florida Department of
Environmental Protection

Recommended Best Management Practices for Mobile Vehicle and Equipment Washing

Background

Mobile vehicle and equipment washing involves washing at a location where vehicles are based (such as a trucking company, warehouse, bus station, vehicle dealership, fairgrounds, etc.) or at an intermediate location where the washing crew and vehicle owners meet solely for the purpose of washing vehicles (such as a business parking lot, gas station, etc.). In contrast, a stationary washing facility is a permanent fixed location where vehicles are driven for washing. Stationary facilities may include commercial car washes for passenger vehicles and commercial or industrial vehicle wash facilities for large trucks and heavy equipment.

Mobile vehicle washing may be performed by commercial washing contractors who temporarily set up washing equipment at the vehicle owner's facility, or by the owner's employees. This type of mobile washing frequently involves fleet vehicles and may include large trucks and heavy equipment. Mobile washing at an intermediate location frequently involves passenger vehicles and is often conducted as a charity or fund raising activity by schools, churches, and youth organizations. It may also be performed as a small-scale business.

Wastewater (including wash water) from any type of vehicle and equipment cleaning can contain significant amounts of substances such as oil and grease, petroleum products, suspended solids such as dirt and grit, heavy metals, detergents, and other pollutants. These contaminants may cause pollution of surface water or ground water and result in violations of water quality standards if the wastewater is not properly managed. Therefore, persons involved in washing operations and the owners of property where washing occurs should follow appropriate Best Management Practices (BMPs), such as those described in this document.

Best Management Practices (BMPs)

BMPs are actions designed to help reduce the amount of pollutants discharged to the environment by improving overall waste management practices and to comply with environmental regulations. The recommended BMPs in this guidance document may be used for any type of mobile washing activity. However, these BMPs are specifically intended to provide guidance for fleet vehicle and heavy equipment washing because those activities can potentially have greater environmental impacts than smaller-scale washing activities.

Recommended Best Management Practices
for Mobile Vehicle and Equipment Washing

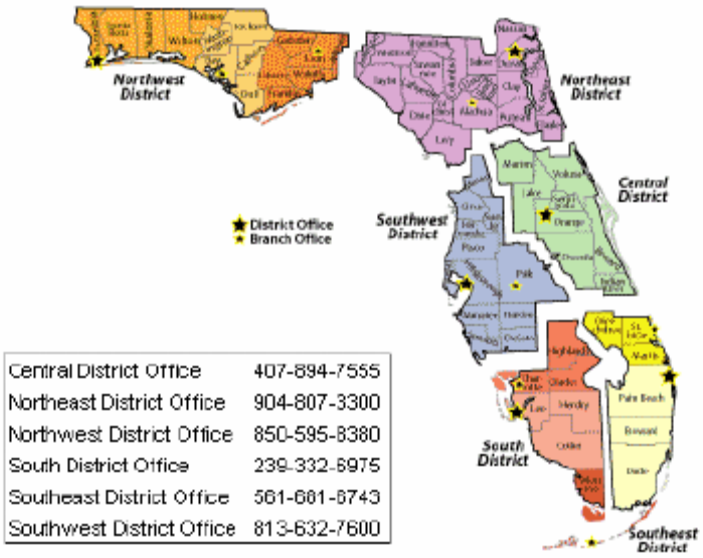
Specific BMPs for Mobile Washing

The following BMPs are recommended to help reduce the amount of pollutants discharged throughout mobile washing procedures and improve the efficiency of the process:

1. Before performing any washing activities
   a. determine how wastewater will be collected and disposed, and
   b. obtain all necessary permits and authorizations.
2. Identify the specific location where you will be disposing wastewater.
3. Identify all stormwater drains, grassy swales and ditches and locate sanitary sewer manholes at the proposed wash area.
4. Observe the slope of the ground at the proposed facility to determine the direction of runoff flow in order to identify an area where washwater can be contained for collection without the possibility of release of a pollutant into the waters of the state of Florida.
5. Only cosmetic washing should be performed, unless a mobile zero discharge closed-loop wash system with an enclosed wash facility is used. Cosmetic washing is defined as washing the exterior of a vehicle, tractor/trailer, or equipment with a biodegradable detergent only for the purpose of removing dirt. Cosmetic washing does not include interior washing, washing of the undercarriage of the vehicle or equipment, engine degreasing, or the use of strongly acidic or strongly alkaline cleaners. Chrome and aluminum brighteners can only be used if they are hand applied and removed by wiping, and are not part of the wash process.
6. Before using a wastewater recycling or pretreatment unit such as an oil/water separator, filtration system, etc., make sure you understand the waste streams that are generated. Identify proper disposal methods for these wastes, and consider disposal costs before starting a job. Some units, especially those that separate oil from water, may generate waste such as waste oil that require special storage and handling practices.
7. Consider contracting with a company that can provide appropriate treatment and disposal of your wastes. This may save you time and money associated with purchasing, permitting, and using your own wastewater treatment equipment. In some cases, you may be able to reduce the liability that comes with the generation and disposal of hazardous waste.
8. Minimize the amount of wastewater generated by using high pressure, low volume washing techniques and equipment.
9. Cosmetic vehicle or equipment washing should be performed on an impermeable surface (such as concrete, asphalt, plastic, etc.), where available. The impermeable area should be large enough to minimize runoff to grassy or bare soil areas.
10. Vehicles should not be washed near uncovered repair areas or chemical storage facilities such that chemicals can be transported in wash water runoff. All wash water runoff should be drained away from a shop repair area or chemical storage facility.
11. Washing and related cleaning activities should minimize flaking of paint chips, or any other potentially hazardous materials from vehicles and equipment. Actions that minimize flaking and chipping may include using lower water pressure and/or avoiding harsh chemicals or solvents.

Recommended Best Management Practices
for Mobile Vehicle and Equipment Washing

12. Solids and other debris should be collected and properly disposed to prevent storm water contamination.
13. Use only the minimum amount of detergents and cleaners that will get the job done. Use products that are labeled "phosphate free" and are rapidly biodegradable. Detergents and soaps used in washing activities should be approximately pH neutral. Avoid using cleaning products if the package label
    a. has a warning that the product is strongly alkaline or strongly acidic, or
    b. indicates the product contains petroleum products or distillates, or
    c. contains chlorinated solvents.
14. Train personnel on chemical use, safety and waste disposal practices.
15. Records of the volume of wastewater generated and disposed should be kept for regulatory spot checks and to provide confirmation to facility owners and customers that wastewater is being properly handled.
16. If a spill of cleaning products occurs:
    a. stop the source of the spill immediately;
    b. contain the spill until cleanup is complete;
    c. use containment booms if the spill may reach a storm drain;
    d. cover a liquid spill with an absorbent material;
    e. keep the area well ventilated;
    f. dispose cleanup materials properly; and
    g. do not use emulsifiers or dispersants.
17. Spills that cause offsite environmental impact or are of a significant volume should be reported to the local Florida Department of Environmental Protection (FDEP) District Office or the city/county environmental program as soon as possible.



Central District Office	407-894-7555
Northeast District Office	904-807-3300
Northwest District Office	850-595-8380
South District Office	239-332-6975
Southeast District Office	561-681-6743
Southwest District Office	813-632-7600

Recommended Best Management Practices
for Mobile Vehicle and Equipment Washing

Wastewater Containment Methods

In many instances it is necessary to collect the wastewater prior to the disposal and/or treatment of the water. Below are a few suggested practices to collect or contain the wastewater created in the washing process:

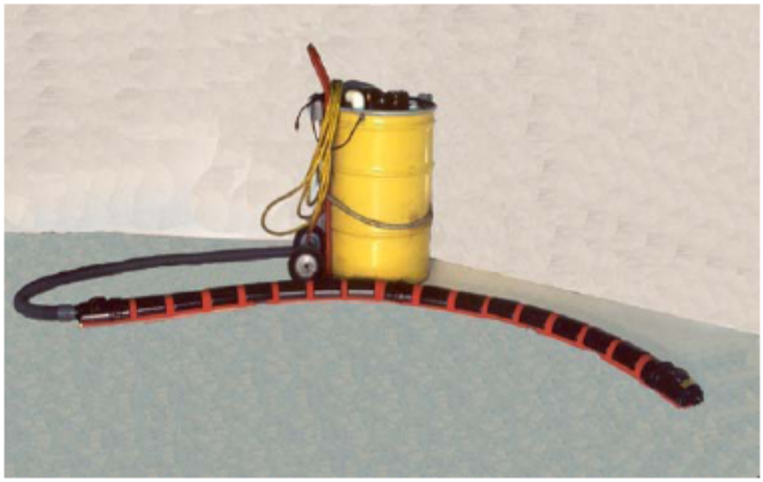
1. **Containment Booms** – Protective barriers can be placed around a storm drain in order to prevent water from entering the drain. They are normally used in order to prevent wastewater from entering a stormwater drain and to pool the wastewater around drain for later collection. However, one potential problem with berms is that they can be ineffective or less effective when the storm drain is located at the bottom of a slope or if there is a large amount of wastewater generated.

2. **Containment Pools** – A containment pool is a temporary structure built to provide an immediate work area for the washing operation. They allow the wastewater to be collected so that pollutants do not enter the storm system and can be built for a variety of sizes, as large as a truck and trailer.

3. **Storm Drain Covers and Mats** – Storm drain covers and mats are items that are placed on top of a storm drain grate in order to seal the drain off from the wastewater and allow the water to collect on top of the drain until it can be collected and properly disposed. They can consist of a variety of devices, including magnetic vinyl mats, PVC drain covers, polyurethane mats, and others. Many times, the covers and mats are used in conjunction with a vacuum pump for the most efficient collection and disposal of the water.

Recommended Best Management Practices
for Mobile Vehicle and Equipment Washing

4. **Vacuums and Pumps** – Devices such as wet/dry vacuums, sump pumps, and vacuum pumps can be used to collect wastewater created by a washing operation. Many vacuum devices include a vacuum boom, which is an attachment that rests flush on the ground and allows the wastewater to be collected through small holes located on the bottom of the boom. Also, for ease of use, many vacuum devices are designed with a second hose that can run from the pump to disposal area, such as a sanitary sewer or a holding tank.



5. **Inflatable Pipe Plug** – Inflatable pipe plugs are similar to the covers and mats listed above in that they prevent wastewater from entering the storm sewer system by blocking the entrance. However, unlike mats and covers, the inflatable plug is inserted into the storm drain pipe and uses the inlet structure below the grate to collect the wastewater. Once inserted, the plug is inflated so that it fits snuggly in the pipe. At the end of the washing operation, the wastewater can then be collected using a pump device. Inflatable plugs should only be used on private property and should not be used in public storm drain inlets or pipes.

6. **Onsite Swales** – Shallow, grassy low areas designed to collect runoff and allow it to seep into the ground without discharging to a stormwater system or to otherwise leave the site. Such onsite swales may provide an additional wastewater collection or disposal option.

Recommended Best Management Practices
for Mobile Vehicle and Equipment Washing

Wastewater Disposal Options

Wastewater that is collected during mobile vehicle and equipment washing must be properly disposed. In general, there are four options available for the disposal of the water. Some of the following options require wastewater permits or authorization from a wastewater utility, as indicated below:

1. Zero-discharge closed-loop water recycling
2. Discharge to a municipal sanitary sewer system (requires authorization from the sanitary wastewater utility)
3. Discharge to land or ground (may require authorization from FDEP or the city/county environmental program)
4. Discharge to surface water (requires an NPDES permit from FDEP, and is typically not practical)

1. Zero-Discharge Closed-Loop Water Recycling Systems

A closed-loop system uses recycled water and has zero or negligible discharge. Stationary systems such as car washing facilities generally require a permit from FDEP. Mobile closed-loop water recycling systems can provide adequate wastewater collection and treatment without having to obtain a permit, provided that wastewater is properly disposed. However, one possible problem is that closed-loop water recycling systems may use chemicals to help remove solids from the waste. When systems use these chemicals, they commonly generate sludge which must be handled safely and disposed in a manner that will not cause pollution of the waters of the state. Another common issue is that the closed-loop recycling systems may have a reservoir to store the recycled water for reuse. It may be necessary to dispose of the reservoir water periodically as oil, grease, and other pollutants accumulate. The following steps should be followed for safe handling and disposal of the sludge and the contaminated reservoir water generated by these systems:

a. Wastewater from a closed-loop system must be either discharged to a municipal sanitary wastewater system (with prior authorization) or disposed at a commercial industrial wastewater treatment facility.

b. The sludge generated in these systems seldom is designated as a hazardous waste, and it can usually be disposed in a sanitary landfill. To be sure, check with the local FDEP District Office or the city/council environmental program and/or landfill operator.

c. If the sludge is considered a hazardous waste, it must be disposed through a permitted treatment, storage, and disposal (TSD) facility.

2. Discharge to a Municipal Sanitary Sewer System

Discharges to a municipal sewerage system receive treatment by the municipal treatment facility before they are finally discharged to the environment (rivers, lakes, sea water, or the land). Wherever practicable, FDEP recommends that discharging wastewater from mobile washing to the sanitary sewer. For fleet washing activities, discharge to the sanitary sewer will be the most economical and best alternative. Discharges to a sanitary sewer must have prior approval from the wastewater utility, and may require some pretreatment. In addition, this disposal method must be approved by the property owner(s) prior to discharge.

Recommended Best Management Practices
for Mobile Vehicle and Equipment Washing

3. Discharge to Land or Ground

Discharges to the ground must be treated to prevent ground water pollution. A grassy ground surface can provide treatment for small (i.e. minimal ponding and no runoff) and infrequent discharges. Regardless of the number and type of vehicle washing activity, all discharges to ground water must comply with state ground water standards. In some areas of the state, such as those over sole source aquifers, discharge to ground may not be allowed or may require further controls. In those sensitive areas, closed-loop water recycling or other disposal options would be necessary. If the wastewater is to be diverted to landscaped areas, damage to plants and soil can be avoided by minimizing or eliminating the use of soaps, detergents, and chemicals. Any solids that would be visible on the ground after discharge must be filtered out of the waste stream. In addition, minimizing the use of water can prevent wastewater overflowing from these areas. Repeated discharges to landscaped areas may result in an accumulation of contaminants, thus damaging vegetation and increasing contaminant levels in the soil. **Note:** If wastewater is repeatedly discharged to the same land area, FDEP may require the facility or the washing contractor to obtain a wastewater permit. Contact the local FDEP District Office or the city/county environmental program prior to discharge for more information.

4. Discharge to Surface Water

Discharge of wastewater to stormwater systems (such as drains, ditches, retention areas) or to surface water (such as lakes, rivers, streams, canals, bays, or to the ocean) is prohibited without an NPDES wastewater permit. Therefore, this option is generally not feasible NPDES wastewater permits typically require a high degree of treatment to meet water quality standards, along with extensive (and costly) monitoring For more information concerning the permitting requirements involved in discharging to surface water, please contact the local FDEP office.