BUREAU OF ENVIRONMENTAL REMEDIATION/REMEDIAL SECTION GUIDELINE

FINAL GUIDANCE FOR VERIFICATION SAMPLING OF NON-HAZARDOUS INDUSTRIAL WASTE WATER PONDS

BER POLICY#BER-RS-006
DATE: 1995
Revised 5/96
PAGES: 7 with attachments

Section Chief: _____ **Date:** 12/28/05

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REVISIONS

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Originator: Frank Arnwine **Date:** 1995

Verification Sampling Plan, 5-22-96

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Introduction

This document presents the Kansas Department of Health and Environment (KDHE), Bureau of Environmental Remediation's (BER) general guidance for conducting soil and/or ground water sampling associated with a non-hazardous industrial wastewater pond (pond) closure. This verification sampling guidance applies only to ponds for which preliminary characterization of the pond water or sludge revealed compounds with concentrations in excess of applicable Federal or KDHE guidelines and the presence of such compounds could pose a contamination threat to the soils or waters of the State. This plan does not apply to ponds where the water, soil, or sludge is considered to be hazardous waste.

Characterization and disposal of pond water and sludge must be coordinated with KDHE's Bureau of Water (BOW). Pond closure verification sampling must be coordinated with BER. In addition, if further characterization or remediation of soil and/or ground water contamination is required pursuant to the pond closure, these activities must also be coordinated with BER.

This outline for pond closure verification sampling reflects the minimal amount of characterization necessary to determine the appropriate course of action for pond closure. Submittal of a formal work plan for proposed activities consistent with this guidance is optional. BER will review, provide comments if necessary, and approve sampling verification work plans if submitted. Alternative approaches for verification sampling will be considered only if they are presented in a work plan submitted for KDHE approval. Submittal of post closure reports to BER is mandatory for all pond closures to which this plan applies.

Soil Sampling Requirements

Once the sludge has been removed, soil samples must be collected from the floor and sides of the excavation and submitted for laboratory analysis. The following guidelines present general sampling requirements and the suggested minimum number and locations for soil sampling based on pond size. The pond size ranges listed in the following text are based on the area of the pond at the designed maximum water elevation.

A. General Sampling Requirements for All Ponds:

1) Composite sampling will be accepted by BER since costs for adequate characterization using discrete sampling may be significant in the preliminary closure stage. However, BER recommends discrete sampling if it is not cost prohibitive.

2) If analytical results from composite samples indicate contamination at levels above their percentage of aliquots comprising the sample; e.g., contaminant concentration in a composite sample derived from four aliquots is greater than 25% of the Federal or State guidelines, or 50% for a two aliquot composite, additional characterization of the soil in the area where aliquots were collected may be required at the discretion of BER.

3) If analytical results from discrete sampling indicate contamination in excess of Federal or State guidelines, additional characterization may or may not be required depending on the completeness of the sampling verification scope employed at the site. If discrete sampling was conducted in accordance with the approved work plan and to the satisfaction of KDHE, additional characterization will not be required for the area previously sampled.

4) During sample collection activities, each aliquot sample must be handled as if it were a discrete sample in accordance with applicable sample collection, handling, and preservation protocol from time of collection through compositing and submittal to a laboratory.

5) Pond floor samples and inlet and outlet samples must be collected from the areas where maximum thicknesses of sludge were observed.

6) Side wall samples must be collected from appropriate vertical locations where contaminants specific to the pond would most likely have impacted soils; e.g., if petroleum product was discharged to the pond, side wall samples must be collected from one foot below the designed maximum water level elevation or the elevation of the average pond water level. Obvious areas of impact as evidenced by staining, etc., must be sampled.

7) Reference "Attachment 1 - Soil Sampling Strategy" for a general illustration of soil sampling strategy as outlined in Sections B through E below.

B. Pond Area less than or equal to 10,000 ft^2:

1) The pond floor is divided into four quadrants of equal area.

2) One aliquot of soil sample is collected from the pond floor surface of each quadrant; equal proportions from each of the four aliquots are combined into one composite sample.

3) One aliquot of soil sample is collected from each side wall of the pond; equal proportions from each of the four aliquots are combined into one composite sample.

4) One aliquot of soil sample is collected at the point where discharge occurred to the pond (inlet) and one aliquot is collected at the point where discharge occurred

from the pond (outlet); equal proportions of the two aliquots are combined into a composite sample.

5) This strategy provides for three composite samples to be submitted for laboratory analysis. If more than one analytical method will be required depending on the range of compounds discharged to the pond, three composite samples will be required for each analytical method.

C. Pond Area greater than 10,000 ft^2 and less than or equal to 43,560 ft^2:

1) The pond floor is divided in two sectors of equal area; each sector is then subdivided into four quadrants of equal area.

2) For each sector, one aliquot is collected from each quadrant and equal proportions from each aliquot are combined into one composite sample. There will be two composite samples for the entire pond floor area.

3) One aliquot of soil sample is collected from each side wall of the pond; equal proportions from each of the four aliquots are combined into one composite sample.

4) One aliquot of soil sample is collected at the pond inlet and one aliquot is collected at the outlet; equal proportions of the two aliquots are combined into a composite sample.

5) This strategy provides for a minimum of four composite samples per analytical method to be submitted for laboratory analysis.

D. Pond area greater than 43,560 ft^2 and less than or equal to 130,000 ft^2:

1) The pond floor area will be divided into four primary quadrants of equal area; each primary quadrant is then subdivided into four sub-quadrants of equal area.

2) For each primary quadrant, one aliquot is collected from each of the four sub-quadrants and equal proportions from each aliquot are combined into one composite sample. There will be four composite samples for the entire pond floor area.

3) Two aliquots of soil sample are collected from each side wall of the pond; equal proportions from four aliquots representing two side walls are combined into one composite sample. There will be two composite samples for the side walls; each of the two composite samples will represent two side walls.

4) One aliquot of soil sample is collected at the pond inlet and one aliquot is collected at the outlet; equal proportions of the two aliquots are combined into a composite sample.

5) This strategy provides for a minimum of seven composite samples per analytical method to be submitted for laboratory analysis

E. Pond area greater than 130,000 ft^2:

1) The sampling verification strategy must be proposed to KDHE and must consist of at least the coverage and amount of sampling required for ponds with areas > 43,560 ft^2 and $\leq$ 130,000 ft^2.

F. Lined Ponds:

1) The sampling strategies described above may need to be adjusted so that samples are collected from areas beneath breaches in the pond liner.

Ground Water Sampling Requirements

Ground water sampling will be required if the vertical extent of contamination is determined to be within 40 feet from ground water. Ground water sampling will be conducted by conventional monitoring well installation and sampling in accordance with the following criteria:

1) **Depth to ground water $\geq$ 40 from surface.** Soil sampling only will be required initially. If soil contamination if found to extend to within 40 feet of ground water during pond characterization, ground water sampling will also be required.

2) **Depth to ground water < 40 feet from surface.** Ground water sampling will be required. Monitoring well requirements are as follows:

a. One monitoring well will be required. The well must be located in the downgradient direction of the pond as close to the pond as practical.

b. If the pond bottom intersects the water table, three monitoring wells will be required to be installed in a triangular configuration around the pond.

Monitoring wells must be designed and installed to detect, in the ground water, compounds of concern previously detected in the pond water or sludge. The proposed monitoring well installation procedures and design must be included in the work plan and will subject to BER review and approval.

If soil contamination is confirmed not to extend to the water table, a monitoring well may not be required, however, this must be clearly proposed as a contingency in the pond closure work plan and will be approved by KDHE on a site specific basis.

Laboratory Analytical Requirements

The proposed analytical methods for laboratory analysis of soil and ground water samples must be consistent with the compounds of concern detected in the pond water or sludge. The pond

closure work plan must indicate the proposed analytical methods. All analyses must be conducted by a KDHE approved laboratory. Attachment 2 lists acceptable analytical methods relative to compounds of concern. In addition, for total petroleum hydrocarbons (TPH) analysis, BER specifies the analytical methods OA-1 and/or OA-2, whichever (or both) is most appropriate for the contaminants of concern.

Verification Sampling Work Plan

If a sampling verification work plan is submitted to BER for review and approval, the work plan must be submitted prior to conducting field activities and it must clearly define the strategy for conducting the pond closure and include at least following items:

1) A very brief history of the site describing activities conducted at the site currently and in the past. Provide the location of the site (city, address, etc.) and include a copy taken from a 7.5 minute topographical quadrangle map that depicts the site location; identify the site location on the map.
2) A description of the pond including areal dimensions, depths of water and sludge, and designed maximum water level elevation. Discuss how the pond was operated; i.e., describe the waste streams entering the pond, when and where discharge from the pond occurred, locations of maximum thicknesses of sludge, and general sludge distribution.

3) A plat, to scale, depicting the pond with pertinent features such as the inlet and outlet locations, pond floor and side walls, areas where maximum thickness of sludge accumulated and, if applicable, areas void of sludge. Include on this plat, or a separate plat, the sampling grid layout, locations proposed for sample collection (aliquots for composites), and the proposed location for a monitoring well(s). If only one well is to be installed, include an arrow depicting expected ground water flow direction.

4) Copies of results from laboratory analysis of the pond water and sludge. Provide a brief description of water and sludge sampling procedures employed.

5) Provide discussion describing in detail the proposed sampling strategy. If a monitoring well is to be installed, provide documentation on expected ground water flow direction to justify the proposed well location.

6) Include a description of proposed monitoring well installation, completion, and development procedures. Provide a schematic diagram of the proposed monitoring well design which includes proposed screen size and interval.

7) Describe the proposed laboratory analytical program for soil and water samples providing the specific analytical methodologies to be used. Include discussion to describe proposed sampling procedures and the quality control/quality assurance procedures to be employed. Identify the laboratory that will be conducting the analyses.

8) Briefly describe investigative derived waste (soil and water) handling, characterization, and disposal procedures.

9) Propose a schedule for conducting the sampling verification.

Notification

If a verification sampling work plan is submitted to BER, BER will either provide comments on the work plan or approve it upon review. If BER has comments or concerns after reviewing a work plan, BER will provide these comments in writing to the indicated contact person. All comments must be resolved prior to approval of the work plan.

Once the work plan is approved, BER will require seven (7) day prior notice of commencing sampling activities. Notice of the exact date and time verification sampling will be conducted must also be provided to the BER contact person to allow KDHE to be present on site and split sample. **BER strongly encourages providing notification of scheduled sampling activities to the BER contact person regardless of whether a verification sampling work plan has been submitted for KDHE approval.**

Sampling Verification Report

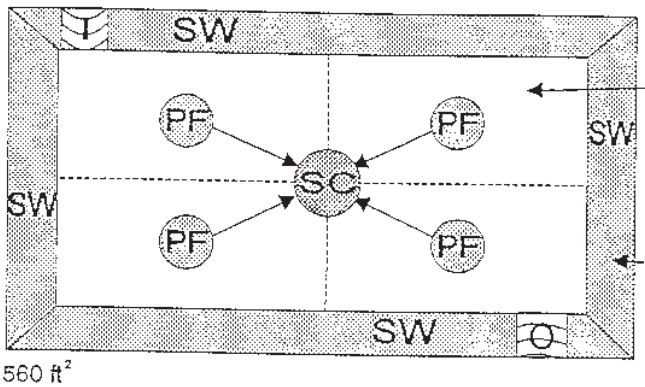
A sampling verification report documenting activities in detail must be provided to KDHE. The report must be adequately detailed to allow KDHE to determine if field activities including sampling, sampling location selection, and laboratory analysis were conducted in accordance with the approved work plan. If a monitoring well was installed, static water levels must be provided and well construction schematics must be included in addition to a copy of the KDHE WWC-5 form. If three monitoring wells were installed, the determined ground water flow direction must be provided. The report must provide, summarize, and discuss the results of all sampling activities.

Sampling Verification Follow-Up

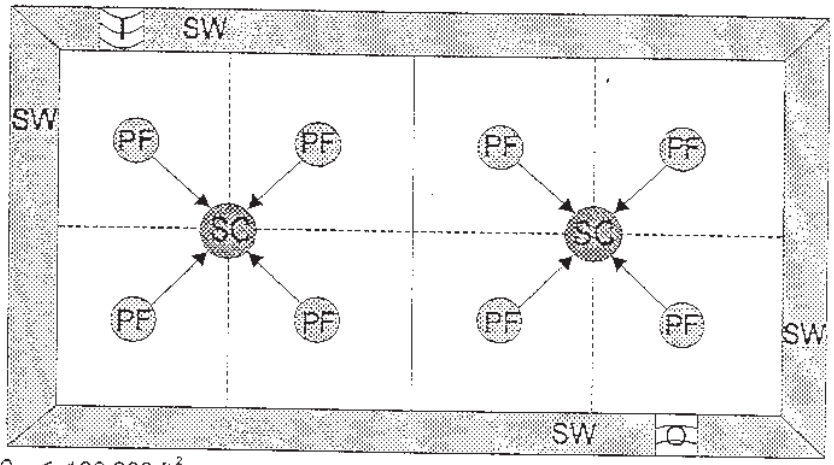
If results from sampling verification activities indicate contamination of soils or ground water in excess of Federal or State guideline does not exist at the site, further characterization will not be required. However, if results indicate contamination in excess of Federal or State guidelines does exist, further characterization of soil and/or ground water contamination may be required. If additional characterization is required by KDHE, the party determined to be responsible for the contamination will be required to sign an Interim Agreement with KDHE which will establish guidelines and objectives for the additional work prior to conducting further characterization.

ATTACHMENT 1 - SOIL SAMPLING STRATEGY

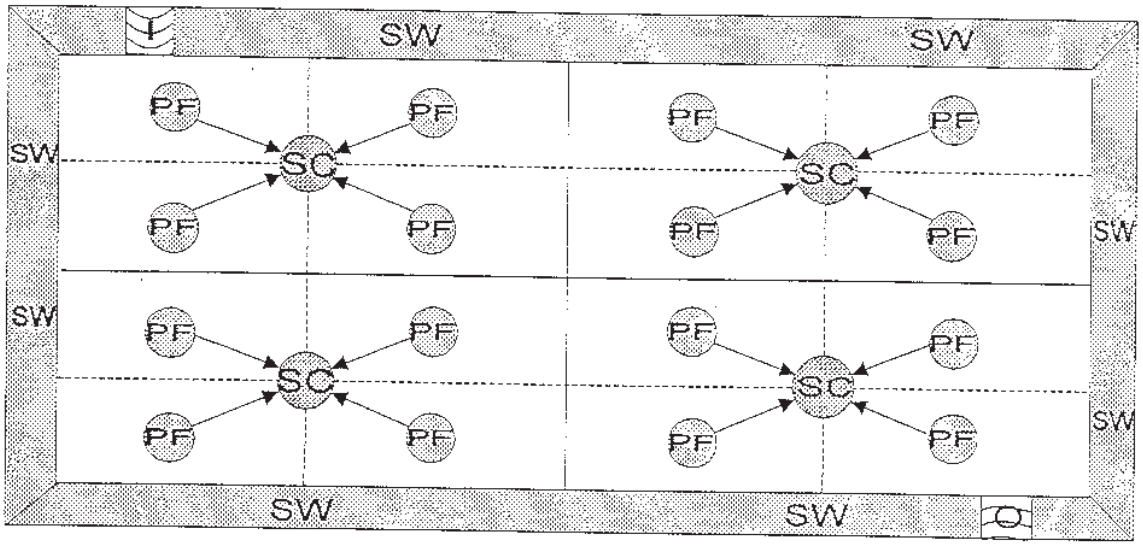
POND AREA ≤ 10,000 ft²



POND AREA > 10,000 - ≤ 43,560 ft²



POND AREA > 43,500 - ≤ 130,000 ft²



SW SIDE WALL ALIQUOT

PF POND FLOOR ALIQUOT

SC SECTOR COMPOSITE

INLET ALIQUOT

OUTLET ALIQUOT

Note: These figures are intended to illustrate sampling strategies only; actual sampling locations must be determined in accordance with text in the Sampling Verification Plan.

ATTACHMENT 2
APPROVED ANALYTICAL METHODS

* Attachment 2 contains tables which list approved methods for Volatile Organic Hydrocarbons (VOCs), Acid Extractables, Base Neutral Compounds, Metals, and Chlorides.

ATTACHMENT 2 (VOLATILE ORGANIC COMPOUNDS)
APPROVED METHODS

PARAMETER GROUP	SDWA (QC)	NPDES (QC)	SW846 (QC)
VOLATILE ORGANIC COMPOUNDS			
GC	502.1 (2)	601 (2)	8010 (1)
GC	502.2 (2)	602 (2)	8020 (1)
GC	503.1 (2)		8021 (1)
GC/MS	524.1 (2)	624 (2)	8240 (2)
GC/MS	524.2 (2)	1624 (2)	8240A (2)
GC/MS			8260 (2)

QUALITY CONTROL

FOLLOW QC SPECIFIED BY METHOD:
1. - FOLLOW GENERAL GC METHODS PROCEDURE EPA SECTION 8000. (3)
2. - QC INCLUDED IN METHOD.
3. - WHEN QC IS NOT SPECIFIED BY METHOD, USE STANDARD METHOD 17th EDITION QA/QC GENERAL INSTRUCTIONS. (2)

SOURCES:

1. "Methods of Chemical Analysis of Water and Wastes." EPA Environmental Monitoring and Support Laboratory, Cincinnati, OH 45268 (EPA-600/4-88-039). Dec. 1988.

2. "Standard Methods for the Examination of Water and Wastewater." 17 th edition, American Public Health Association, American Water Works Association, Water Pollution Control Federation, 1989.

3. "Test Methods for the evaluation of Solid Waste." EPA Office of Solid Waste and Emergency Response, Washington, DC 20460. November 1986. SW 846 Third Edition.

4. Federal Register Vol. 49, No. 209.

rev. 8/20/92

ATTACHMENT 2
Volatile Organic Compounds
METHODS

Analytes	SDWA					NPDES				SW-846			
Acetone								1624,					
Acrolein								1624,					
Acrylonitrile								1624,					
Benzene		502.2,	503.1,	524.1,	524.2,		602,	624,	1624,	8020,	8021,	8240,	8260
Bromobenzene	502.1,	502.2,	503.1,	524.1,	524.2						8021,		8260
Bromochloromethane	502.1,	502.2,		524.1,	524.2,	601,					8021,		8260
Bromodichloromethane	502.1,	502.2,		524.1,	524.2,				1624,	8010,	8021,	8240,	8260
Bromoform	502.1,	502.2,		524.1,	524.2	601,		624,	1624,	8010,	8021,	8240,	8260
Bromomethane		502.2,		524.1,	524.2,			624,	1624,	8010,	8021,	8240,	8260
2-Butanone												8240,	
n-Butylbenzene		502.2,	503.1,		524.2,			624,			8021,		8260
sec-Butylbenzene		502.2,	503.1,		524.2						8021,		8260
tert-Butylbenzene		502.2,	503.1,		524.2						8021,		8260
Carbon disulfide												8240,	
Carbon Tetrachloride	502.1,	502.2,		524.1,	524.2,	601,		624,	1624,	8010,	8021,	8240,	8260
Chlorobenzene	502.1,	502.2,	503.1,	524.1,	524.2,	601,	602,	624,	1624,	8010,	8020, 8021,	8240,	8260
Chloroethane	502.1,	502.2,		524.1,	524.2,	601,		624,	1624,	8010,	8021,	8240,	8260
2-Chloroethylvinyl ether						601,		624,	1624,	8010,		8240,	
Chloroform	502.1,	502.2,		524.1,	524.2,	601,		624,	1624,	8010,	8021,	8240,	8260
Chloromethane	502.1,	502.2,		524.1,	524.2,	601,		624,	1624,	8010,	8021,	8240,	8260
2-Chlorotoluene	502.1,	502.2,	503.1,	524.1,	524.2						8021,		8260
4-Chlorotoluene	502.1,	502.2,	503.1,	524.1,	524.2						8021,		8260
Dibromochloromethane	502.1,	502.2,		524.1,	524.2,	601,		624,	1624,	8010,		8240,	8260
1,2-Dibromo-3-chloropropane				524.1,	524.2						8021,		8260
1,2-Dibromomethane	502.1,	502.2,		524.1,	524.2						8021,	8260	
Dibromomethane		502.1,	502.2,		524.1,	524.2						8021,	8260
1,2-Dichlorobenzene		502.1,	502.2,	503.1,	524.1,	524.2,	601,	602,	624,		8010,	8020, 8021,	8260
1,3-Dichlorobenzene		502.1,	502.2,	503.1,	524.1,	524.2,	601,	602,	624,		8010,	8020, 8021,	8260
1,4-Dichlorobenzene		502.1,	502.2,	503.1,	524.1,	524.2,	601,	602,	624,		8010,	8020, 8021,	8260
Dichlorodifluoromethane		502.1,	502.2,		524.1,	524.2,	601,				8010,	8021,	8260
1,1-Dichloroethane		502.1,	502.2,		524.1,	524.2,	601,		624,	1624,	8010,	8021,	8240, 8260
1,2-Dichloroethane		502.1,	502.2,		524.1,	524.2,	601,		624,	1624,	8010,	8021,	8240, 8260
1,1-Dichloroethene		502.1,	502.2,		524.1,	524.2,	601,		624,	1624,	8010,	8021,	8240, 8260
cis-1,2-Dichloroethene		502.1,	502.2,		524.1,	524.2						8021,	8260
trans-1,2-Dichloroethene		502.1,	502.2,		524.1,	524.2,	601,		624,	1624,	8010,	8021,	8240, 8260
1,2-Dichloropropane		502.1,	502.2,		524.1,	524.2,	601,		624,	1624,	8010,	8021,	8240, 8260
1,3-Dichloropropane		502.1,	502.2,		524.1,	524.2						8021,	8260
2,2-Dichloropropane		502.1,	502.2,		524.1,	524.2						8021,	8260
1,1-Dichloropropene		502.1,	502.2,		524.1,	524.2						8021,	8260
cis-1,3-Dichloropropene		502.1,	502.2,		524.1,	524.2,	601,		624,	1624,		8021,	8240,
trans-1,3-Dichloropropene		502.1,	502.2,		524.1,	524.2,	601,		624,	1624,	8010,	8021,	8240,

ATTACHMENT 2
Volatile Organic Compounds
METHODS

Analytes	SDWA					NPDES				SW-846			
Diethyl ether								1624,					
p-Dioxane									1624,				
Ethylbenzene		502.2,	503.1,	524.1,	524.2,	602,	624,	1624,		8020,	8021,	8240,	8260
Hexachlorobutadiene	502.2,	503.1,		524.2						8021,		8260	
2-Hexanone												8240,	
Isopropylbenzene		502.2,	503.1								8021,		8260
4-Isopropyltoluene		502.2,	503.1,		524.2								
Methylene Chloride	502.1,	502.2,		524.1,	524.2,	601,	624,	1624,	8010		8021	8240,	8260
4-Methyl-2-pentanone												8240,	
Naphthalene		502.2,	503.1,		524.2						8021,		8260
n-Propylbenzene		502.2,	503.1,		524.2						8021,		8260
Styrene		502.2,	503.1,	524.1,	524.2						8021,	8240,	8260
1,1,1,2-Tetrachloroethane	502.1,	502.2,		524.1,	524.2						8021,		8260
1,1,2,2-Tetrachloroethane	502.1,	502.2,		524.1,	524.2,	601,	624,	1624,	8010,		8021,	8240,	8260
Tetrachloroethene	502.1,	502.2,	503.1,	524.1,	524.2,	601,	624,	1624,	8010,		8021,	8240,	8260
Toluene		502.2,	503.1,	524.1,	524.2,	602,	624,	1624,		8020,	8021,	8240,	8260
1,2,3-Trichlorobenzene		502.2,	503.1,		524.2						8021,		8260
1,2,4-Trichlorobenzene		502.2,	503.1,		524.2						8021,		8260
1,1,1-Trichloroethane	502.1,	502.2,		524.1,	524.2,	601,	624,	1624,	8010,		8021,	8240,	8260
1,1,2-Trichloroethane	502.1,	502.2,		524.1,	524.2,	601,	624,	1624,	8010,		8021,	8240,	8260
Trichloroethene	502.1,	502.2,	503.1,	524.1,	524.2	601,	624,	1624,	8010,		8021,	8240,	8260
Trichlorofluoromethane	502.1,	502.2,		524.1,	524.2,	601,	624,		8010,		8021,		8260
1,2,3-Trichloropropane	502.1,	502.2,		524.1,	524.2						8021,		8260
1,2,4-Trimethylbenzene		502.2,	503.1,		524.2						8021,		8260
1,3,5-Trimethylbenzene		502.2,	503.1,		524.2						8021,		8260
Vinyl Acetate												8240,	
Vinyl Chloride	502.1,	502.2,		524.1,	524.2,	601,	624,	1624,	8010,		8021,	8240,	8260
o-Xylene		502.2,	503.1,	524.1,	524.2						8021,		8260
m-Xylene		502.2,	503.1,	524.1,	524.2						8021,		8260
p-Xylene		502.2,	503.1,	524.1,	524.2						8021,		8260
Total Xylenes										8020,		8240,	

ATTACHMENT 2 (CHLORIDES)

APPROVED ANALYTICAL METHODS (WATER)

Analyte	EPA [1]	ASTM [2]	SM [3]	USGS [4]	SW-846 [5]
CHLORIDE					
AUTOMATED (Ferricyanide)	325.1 or 325.2		4500-Cl-C	1-2187-85	9250 or 9251
TITRIMETRIC ($AgNO_3$)		D512-89(B)	4500-Cl-B	1-1183-85	
TITRIMETRIC ($Hg(NO_3)_2$)	325.3	D512-89(A)	4500-Cl-C	1-1184-85	9252

SOIL: Analytical methods to determine chloride concentrations in soil samples must be proposed to KDHE for review and approval and should generally consist of a water extraction method combined with one of the approved analytical methods for water as indicated above.

QUALITY CONTROL: Quality Control (QC) should be included in method; however, if QC is not specified by method, use Standard Method 17th Edition QA/QC General Instructions.

FOOTNOTES:

1. "Methods of Chemical Analysis of Water and Wastes." EPA Environmental Monitoring and Support Laboratory, Cincinnati, OH 45268 (EPA-600/4-79-020). March 1983.

2. Annual Book of ASTM Standards, Vol. 11.01, American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103.

3. "Standard Methods for the Examination of Water and Wastewater." 17 th edition, American Public Health Association, American Water Works Association, Water Pollution Control Federation, 1989.

4. Fishman, M.J., et. al, "Methods for Analysis of Inorganic Substances in Water and Fluvial Sediments," U.S. Department of the Interior, Techniques of Water Resources Investigations of the U. S. Geological Survey, Denver CO, Revised 1989, unless otherwise stated.

5. "Test Methods For Evaluating Solid Waste." SW-846, Third edition, USEPA, Office of Solid Waste and Emergency Response, Washington, DC, 1986.

ATTACHMENT 2
BASE NEUTRAL COMPOUNDS (KAL LIST)
METHODS

	CAS	SDWA	NPDES	SW-846
Acenaphthylene	208-96-8	525	610,625,1625/SM6410B,6440B	8100,8250,8270,8310
Anthracene	120-12-7	525	610,625,1625/SM6410B,6440B	8100,8250,8270,8310
Benzidene	98 87-5		605,625,1625	8250,8270
Benzo[a]anthracene	56 55-3	525	610,625,1625/SM6410B,6440B	8100,8250,8270,8310
Benzo[a]pyrene	50-32-8	525	610,625,1625/SM6410B,6440B	8100,8250,8270,8310
Benzo[b]fluoranthene	205-99-2	525	610,625,1625/SM6410B,6440B	8100,8250,8270,8310
Benzo[g,h,i]perylene	191-24-2	525	610,625,1625/SM6410B,6440B	8100,8250,8270,8310
Benzo[k]fluoranthene	207-08-9	525	610,625,1625/SM6410B,6440B	8100,8250,8270,8310
Bis(2-chlorethoxy)methane	111-91-1		611,625,1625/SM6410B	8250,8270
Bis(2-chloroethyl)ether	111-44-4		611,625,1625/SM6410B	8250,8270
Bis(2-chloroisopropyl)ether	108-60-1			8250,8270
Bis(2-ethylhexyl)phthalate	117-81-7	525		8140
Bromophenyl phenyl ether, 4-	101-55-3		611,625,1625/SM6410B	8250,8270
Butyl benzyl phthalate	85-68-7	525	606,625,1625/SM6410B	8250,8270
Chloronaphthalene, 2-	91-58-7		612,625,1625/SM6410B	8120,8250,8270
Chlorophenyl phenyl ether, 4-	7005-72-3		611,625,1625/SM6410B	8250,8270
Chrysene	218-01-9	507	610,625,1625/SM6410B,6420B	8100,8250,8270,8310
Dibenzo[a,h]anthracene	53-70-3	525	610,625,1625/SM6410B,6440B	8100,8250,8270,8310
Dichlorobenzene, 1,2- (o-)	95-50-1	502.1,502.2,503.1 524.1,524.2	601,602,612,625,624,1625/SM6410B,6430B 6220B	8120,8250,8270
Dichlorobenzene, 1,3- (m-)	541-73-1	502.1,502.2,503.1 524.1,524.2	601,602,612,625,624,1625/SM6410B,6430B 6220B	8120,8250,8270
Dichlorobenzene, 1,4- (p-)	106-46-7	502.1,502.2,503.1 524.1,524.2	601,602,612,625,624,1625/SM6410B,6430B 6220B	8120,8250,8270
Dichlorobenzidene, 3,3'	91-94-1		605,625,1625/SM6410B	8250,8270
Diethylphthalate	84-66-2	525	606,625,1625/SM6410B	8060,8250,8270
Dimethylphthalate	131-11-3	525	606,625,1625/SM6410B	8060,8250,8270
Dinitrotoluene, 2,4-	121-14-2		609,625,1625/SM6410B	8090,8250,8270
Dinitrotoluene, 2,6-	606-20-2		609,625,1625/SM6410B	8090,8250,8270
Diphenylhydrazine, 1,2-	122-66-7			8250,8270
Di-n-butyl phthalate	84-74-2			8060,8250,8270
Di-n-octyl phthalate	117-84-0			8060
Fluoranthene	206-44-0		610,625,1625/SM6410B,6440B	8100,8250,8270,8310
Fluorene	86-73-7	525	610,625,1625/SM6410B,6440B	8100,8250,8270,8310
Hexachlorobenzene	118-74-1	505,508,525	612,625,1625/SM6410B	8120,8250,8270
Hexachlorobutadiene	87-68-3	502.2,503.1,524.2	612,625,1625/SM6410B	8120,8250,8270
Hexachlorocyclopentadiene	77-47-4	505,525	612,625,1625/SM6410B	8120,8250,8270
Hexachloroethane	67-72-1		616,625,1625/SM6410B	8250,8270

Ideno[1,2,3-c,d]pyrene	193-39-5	525		8100,8250,8270,8310

Isophorone	78-59-1		609,625,1625/SM6410B	8090,8250,8270
Naphthalene	91-20-3	505.2,503.1,524.1	610,625,1625/SM6410B,6440B	8021,8100,8250,8270,8310
Nitrobenzene	98-95-3		609,625,1625/6410B	8090,8250,8270
N-nitrosodimethylamine	62-75-9		607,625,1625/SM6410B	8250,8270
N-nitrosodiphenylamine	86-30-6		607,625,1625,SM6410B	8250,8270
N-nitrosodi-n-propylamine	621-64-7		607,625,1625,SM6410B	8250,8270
Phenanthrene	85-01-8	525	610,625,1625/SM6410B,6440B	8100,8250,8270,8310
Pyrene	129-00-0	525	610,625,1625/SM6410B,6440B	8100,8250,8270,8310
Styrene	100-42-5	502.2,503.1, 524.1,524.2		
Trichlorobenzene, 1,2,4-	120-82-1	502.2,503.1,524.2	612,625,1625,1625,SM6410B	8021,8120,8250,8270

PESTICIDE (KAL LIST)

	CAS	SDWA	NPDES	SW-846
Acifluorfen (Blazer)	5094-66-6	515.1		
Alachlor (Lasso)	15972-60-8	505,507,525.1		
Aldicarb (Temik)	116-6-1	531.1		
Aldrin	309-00-2	505,508,525	608,625/SM6630B&C	8080,8250,8270
Ametryn	834-12-8	507		
Ammonium sulfamate (Ammate)	7773-06-0			
Atrazine (AAtrex)	1912-24-9	505,507,525		
Bentazon (Basagran)	25057-89-0	515.1		
BHC, total (Lindane)	58-89-9	505,508,525.1	608,625/SM6630B&C,6410B	8080,8250,8270
Bromacil (Hyvar)	314-40-9			
Butylate (Sutan +)	2008-41-5	507		
Carbaryl (Sevin)	63-25-2	531.1		
Carbofuran (Furadan)	1553-66-2	531.1		
Carboxin	5234-68-4	507		
Chloramben (Amiben)	133-90-4	515.1		
Chlordane	57-74-9	505,508,525.1	606,625,SM6410B,6630B&C	8080,8270,8250
Chlorothalonil	1897-45-6	508		
Chlorpyrifos (Lorsban/Dursban)	2921-88-2			8140
Cyanazine (Bladex)	21725-46-2			
D, 2,4-	94-75-7	515.1	SM6640B	8150
Dalapon	75-99-0	515.1		8150
DBCP (1,2-dibromo,3-chloropropane)	96-12-8	504,524.1	SM6210	8240
DCPA, (Dacthal)	1861-32-1	508	608,625/SM6630,6410B	8080
DDD, 4,4'-(p,p'-DDD)	53-19-0	508	608/SM6630B&C	8080,8250,8270
DDE,4,4'-(p,p'-DDE)	342-48-26	508	608,625/SM6630B&C,6410B	8080,8250,8270
DDT, o,p'-	50-29-3	508	608,625/SM6630B&C,6410B	8080,8250,8270
DDT,p,p'-	50-29-3	508	608,625/SM6630B&C,6410B	8080,8250,8270
Diazinon	333-41-5	507		8140
Dibromoethane, 1,2- (EDB)	106-93-4	502.1,502.2,504, 524.1,524.2		
Dicamba (Banvel)	1918-00-9	515.1		8150
Dieldrin	60-57-1	505,508	608	8080,8250,8270
Dimethoate (Cygon)	60-51-5			8270
Dimethrin	67239-16-1			
Dinoseb (DNBP)	88-85-7	515.1		8150
Dioxane, p-	123-91-1			8240
Diphenamid	957-51-7	507		
Disulfoton (Di-Syston)	298-04-4	507		8140
Diuron (Karmex)	330-54-1			
Endosulfan, alpha	115-29-7	508	608,625/SM6410B,6630B&C	8080,8250,8270
Endosulfan, beta	115-29-7	508	608,625/SM6410B,6630B&C	8080,8250,8270
Endosulfan sulfate	1031-07-8	508	608,625/SM6410B,6630C	8080,8250,8270

Endothall	145-73-3	548		

Endrin	145-73-3	505,508,525.1	608,625/SM6410B,6630B&C	8080,8250,8270
Endrin aldehyde	72-20-8	505,508,525.1		8080,8250,8270
EPTC (Eptam/Eradicane)	759-94-4	507		
Ethylene thiourea	96-45-7			
Fenamiphos (Nemacur)	22224-92-6	507		
Fenvalerate (Pydrin)	51630-58-1			
Fluometuron	2164-17-2			
Fonofos (Dyfonate)	944-22-9			
Glyphosate (Roundup)	1071-83-6	547		
Heptachlor	76-44-8	505,508,525.1	608,625/SM6410B	8080,8250,8270
Heptachlor epoxide	1024-57-3	505,508,525.1	608,625/SM6410B,6630B&C	8080,8250,8270
Hexazinone (Velpar)	51235-04-2			
Igran (Terbutryn)		507		
IPC (Propham)	122-42-9			
Malathion	121-75-5		SM6630C	
Maleic hydrazine	123-33-1			
MCPA (Weedone)	94-74-6			8150
Methomyl	21087-64-9	531.1		
Methoxychlor (Marlate)	72-43-5	505,508,525.1	SM6630 B&C	
Methyl parathion	298-00-0			
Metolachlor (Dual)	51218-45-2	507		
Metribuzin (Sencor)	21087-64-9	507		
Oryzalin (Surflan)	19044-88-3			
Oxamyl	23135-22-0	531.1		
Paraquat	1910-42-5	549		
Parathion	56-38-2		SM6630C	8140,8270
PCBs (total)	11097-69-1	505,508	608	8080
Pendimethalin (Prowl)	40318-45-4			
Permethrin (Ambush)	52645-53-1	508	SM6630	
Picloram (Tordon)	1918-2-1	515.1		
Prometon (Pramitol)	1610-18-0	507		
Pronamide (Kerb)	23950-58-5	507		8250,8270
Propachlor (Ramrod)	1918-16-7	508		
Propargite (Omite/Comite)				
Propazine (Milogard)	139-40-2	507		
Propoxur (Baygon)	114-26-1	531.1		
Simazine (Princep)	122-34-9	505,507,525.1		
T, 2,4,5-	93-76-5	515.1	SM6640B	8150
TCDD, 2,3,7,8- (Dioxin)	1746-1-6	513	613,1613	
Tebuthiuron (Spike)	34014-18-1	507		
Terbacil (Sinbar)	5902-51-2			
Terbufos (Counter)	13071-74-9	507		
Toxaphene	8001-35-2	505,508,525.1	608,625/SM6630B&C,6410B	8250,8270
TP, 2,4,5- (Silvex)	93-72-1	515.1	SM6640B	8150
Trifluralin (Treflan)	1582-09-8	508	SM6630B	8270

ATTACHMENT 2 (METALS)

	EPA 200 SERIES	SW-846 7000 SERIES	SM[1] 3000 SERIES	EPA 200.7	ICP SW-846 6010	SM 3120
ALUMINUM	202.1,202.2	7020	3111D,E,3113	X	X	X
ANTIMONY	204.1,204.2	7040,7041	3111B,3113	X	X	X
ARSENIC	206.2,206.3 206.4,206.5	7060,7061	3113,3114	X	X	X
BARIUM	208.1,208.2	7080,7081	3111D,3113	X	X	X
BERILLIUM	210.1,210.2	7090,7091	3111D,E,3113	X	X	X
BISMUTH			3111B			
BORON	212.3			X	X	X
CADMIUM	213.1,213.2	7130,7131	3111B,C,3113	X	X	X
CALCIUM	215.1,215.2	7140	3111B	X	X	X
CESIUM			3111B			
CHROMIUM	218.1,218.2,218.3	7190,7191	3111B,C,3113	X		X
CHROMIUM-HEX	218.4,218.5	7195,7196, 7197,7198				
COBALT	219.1,219.2	7200,7201	3111B,C,3113	X	X	X
COPPER	220.1,220.2	7210,7211	3111B,C,3113	X	X	X
GOLD	231.1,231.2		3111B			
IRIDIUM	235.1,235.2		3111B			
IRON	236.1,236.2	7380,7381	3111B,C,3113	X	X	X
LEAD	239.1,239.2	7420,7421	3111B,C,3113	X	X	X
LITHIUM			3111B			X
MAGNESIUM	242.1	7450	3111B	X	X	X
MANGANESE	243.1,243.2	7460,7461	3111B,C,3113	X	X	X

[1]STANDARD METHODS - FOR THE EXAMINATION OF WATER AND WASTEWATER - 17TH EDITION.

MERCURY	245.1,245.2,245.3	7470,7471	3112			
MOLYDENUM	246.1,246.2	7480,7481	3111D,3113	X	X	X
NICKEL	249.1,249.2	7520	3111B,C,3113	X	X	X
OSMIUM	252.1,252.2	7550	3111D			
PALLADIUM	253.1,253.2		3111B			
PLATINUM	255.1,255.2		3111B			
POTASSIUM	258.1	7610	3111B	X	X	X
RHENIUM	264.1,264.2		3111D			
RHODIUM	265.1,265.2		3111B			
RUTHENIUM	267.1,267.2		3111B			
SELENIUM	270.2,270.3	7740,7741	3113,3114	X	X	X
SILICA				X		X
SILICON			3111D		X	
SILVER	272.1,272.2	7760	3111B,C,3113	X	X	X
SODIUM	273.1,273.2	7770	3111B	X	X	X
STRONTIUM			3111B			X
THALLIUM	279.1,279.2	7840,7841	3111B	X		X
THORIUM			3111D			
TIN	282.1,282.2	7870	3111B,3113			
TITANIUM	283.1,283.2		3111D			
VANADIUM	286.1,286.2	7910,7911	3111D	X	X	X
ZINC	289.1,289.2	7950,7951	3111B,C	X	X	X