National Pollutant Discharge Elimination System (NPDES) Permit Program

F A C T S H E E T

Regarding an NPDES Permit To Discharge to Waters of the State of Ohio
for **Ohio River Clean Fuels, LLC**

Public Notice No.: 08-04-049
Public Notice Date: April 11, 2008
Comment Period Ends: May 11, 2008

OEPA Permit No.: **3IG00097*AD**
Application No.: **OH0140597**

Name and Address of Applicant:

Ohio River Clean Fuels, LLC
9013 NE Highway 99, Suite S
Vancouver, Washington 98665

Name and Address of Facility Where Discharge Occurs:

Ohio River Clean Fuels
Sixteen School Road
Wellsville, Ohio
Columbiana County

Receiving Water: **Ohio River**

Subsequent
Stream Network: N/A

Introduction

Development of a Fact Sheet for NPDES permits is required by Title 40 of the Code of Federal Regulations, Section 124.8 and 124.56. This document fulfills the requirements established in those regulations by providing the information necessary to inform the public of actions proposed by the Ohio Environmental Protection Agency, as well as the methods by which the public can participate in the process of finalizing those actions.

This Fact Sheet is prepared in order to document the technical basis and risk management decisions that are considered in the determination of water quality based NPDES Permit effluent limitations. The technical basis for the Fact Sheet may consist of evaluations of promulgated effluent guidelines and other treatment-technology based standards, existing effluent quality, instream biological, chemical and physical conditions, and the allocations of pollutants to meet Ohio Water Quality Standards. This Fact Sheet details the discretionary decision-making process empowered to the director by the Clean Water Act and Ohio Water Pollution Control Law (ORC 6111). Decisions to award variances to Water Quality Standards or promulgated effluent guidelines for economic or technological reasons will also be justified in the Fact Sheet where necessary.

Effluent limits based on available treatment technologies are required by Section 301(b) of the Clean Water Act. Many of these have already been established by U.S. EPA in the effluent guideline regulations (a.k.a. categorical regulations) for industry categories in 40 CFR Parts 405-499. Technology-based regulations for publicly-owned treatment works are listed in the Secondary Treatment Regulations (40 CFR Part 133). If regulations have not been established for a category of dischargers, the director may establish technology-based limits based on best professional judgment (BPJ).

Ohio EPA reviews the need for water-quality-based limits on a pollutant-by-pollutant basis. Wasteload allocations are used to develop these limits based on the pollutants that have been detected in the discharge, and the receiving water's assimilative capacity. The assimilative capacity depends on the flow in the water receiving the discharge, and the concentration of the pollutant upstream. The greater the upstream flow, and the lower the upstream concentration, the greater the assimilative capacity is. Assimilative capacity may represent dilution (as in allocations for metals), or it may also incorporate the break-down of pollutants in the receiving water (as in allocations for oxygen-demanding materials).

The need for water-quality-based limits is determined by comparing the wasteload allocation for a pollutant to a measure of the effluent quality. The measure of effluent quality is called PEQ - Projected Effluent Quality. This is a statistical measure of the average and maximum effluent values for a pollutant. As with any statistical method, the more data that exists for a given pollutant, the more likely that PEQ will match the actual observed data. If there is a small data set for a given pollutant, the highest measured value is multiplied by a statistical factor to obtain a PEQ; for example if only one sample exists, the factor is 6.2, for two samples - 3.8, for three samples - 3.0. The factors continue to decline as samples sizes increase. These factors are intended to account for effluent variability, but if the pollutant concentrations are fairly constant, these factors may make PEQ appear larger than it would be shown to be if more sample results existed.

Summary of Permit Conditions

This permit contains treatment technology-based limits at the various treatment systems that would be used by Ohio River Clean Fuels. Water quality-based limits are included at outfall 001.

Treatment technology limits for the oil/water separator, settling basin, coal pile treatment pond, boiler blowdown and chemical metal cleaning wastewater are based on New Source Performance Standards (NSPS) for the Steam Electric Power Industry. These waste streams are very similar to discharges from power generating facilities.

Treatment technology limits for the biological treatment plant were established using Best Professional Judgment, the performance of existing treatment facilities at petroleum refineries, and NSPS regulations for the Organic Chemicals, Plastics and Synthetic Fibers (OCPSF) Industry. While this discharge does not exactly fit either the Petroleum Refining or OCPSF categories, the waste water treated and the treatment system proposed in concept are very similar to these industries.

Treatment technology limits for the coal-to-liquids process wastewater were also established using Best Professional Judgment and the limits for the biological treatment process. Limits on additional pollutants were established using the NSPS regulations for the OCPSF Industry.

The final discharge contains water quality based limits for a number of pollutant parameters that may be present in the final discharge due to contact with process materials, or concentration of pollutants from the Ohio River or plant piping. The permit also contains a limit on acute toxicity to ensure that the discharge is not toxic to aquatic life.

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Procedures for Participation in the Formulation of Final Determinations

The draft action shall be issued as a final action unless the Director revises the draft after consideration of the record of a public meeting or written comments, or upon disapproval by the Administrator of the U.S. Environmental Protection Agency.

Within thirty days of the date of the Public Notice, any person may request or petition for a public meeting for presentation of evidence, statements or opinions. The purpose of the public meeting is to obtain additional evidence. Statements concerning the issues raised by the party requesting the meeting are invited. Evidence may be presented by the applicant, the state, and other parties, and following presentation of such evidence other interested persons may present testimony of facts or statements of opinion.

Requests for public meetings shall be in writing and shall state the action of the Director objected to, the questions to be considered, and the reasons the action is contested. Such requests should be addressed to:

Legal Records Section
Ohio Environmental Protection Agency
P.O. Box 1049
Columbus, Ohio 43216-1049

Interested persons are invited to submit written comments upon the discharge permit. Comments should be submitted in person or by mail no later than 30 days after the date of this Public Notice. Deliver or mail all comments to:

Ohio Environmental Protection Agency
Attention: Division of Surface Water
Permits and Compliance Section
P.O. Box 1049
Columbus, Ohio 43216-1049

The OEPA permit number and Public Notice numbers should appear on each page of any submitted comments. All comments received no later than 30 days after the date of the Public Notice will be considered.

Citizens may conduct file reviews regarding specific companies or sites. Appointments are necessary to conduct file reviews, because requests to review files have increased dramatically in recent years. The first 250 pages copied are free. For requests to copy more than 250 pages, there is a five-cent charge for each page copied. Payment is required by check or money order, made payable to Treasurer State of Ohio.

Location of Discharge/Receiving Water Use Classification

Ohio River Clean Fuels would discharge to the Ohio River at approximately Ohio River Mile (RM) 49.7. The approximate location of the facility is shown in Figure 1.

This segment of the Ohio River is described by Ohio EPA River Code: 25-700, USEPA River Reach #: 05030101-002, County: Columbiana, Ecoregion: Western Allegheny Plateau. The Ohio River is presently designated for the following uses: Warmwater Habitat (WWH), Agricultural Water Supply (AWS), Industrial Water Supply (IWS), Public Water Supply (PWS) and Bathing Water (BW). The Ohio River must also meet the specific water quality standards in OAC 3745-1-32.

Use designations define the goals and expectations of a waterbody. These goals are set for aquatic life protection, recreation use and water supply use, and are defined in the Ohio WQS (OAC 3745-1-07). The use designations for individual waterbodies are listed in rules -08 through -32 of the Ohio WQS. Once the goals are set, numeric water quality standards are developed to protect these uses. Different uses have different water quality criteria.

Use designations for aquatic life protection include habitats for coldwater fish and macroinvertebrates, warmwater aquatic life and waters with exceptional communities of warmwater organisms. These uses all meet the goals of the federal Clean Water Act. Ohio WQS also include aquatic life use designations for waterbodies which can not meet the Clean Water Act goals because of human-caused conditions that can not be remedied without causing fundamental changes to land use and widespread economic impact. The dredging and clearing of some small streams to support agricultural or urban drainage is the most common of these conditions. These streams are given Modified Warmwater or Limited Resource Water designations.

Recreation uses are defined by the depth of the waterbody and the potential for wading or swimming. Uses are defined for bathing waters, swimming/canoeing (Primary Contact) and wading only (Secondary Contact - generally waters too shallow for swimming or canoeing).

Water supply uses are defined by the actual or potential use of the waterbody. Public Water Supply designations apply near existing water intakes so that waters are safe to drink with standard treatment. Most other waters are designated for agricultural and industrial water supply.

Facility Description

The proposed Ohio River Clean Fuels facility would produce diesel fuel and synthetic naphtha from coal. The operations will utilize 7 million tons of coal per year, and some biomass to produce approximately 53,000 barrels per day of fuel and naphtha.

The operational units include coal and biomass storage facilities, coal/biomass milling and drying and stock transfer facilities. Coal and biomass is then transferred to the coal-to-liquid process, which consists of gasification that generates a synthetic gas, which is conditioned in the acid gas removal process to recover sulfur and remove mercury. Conditioned syngas is further processed in the Fischer-Tropsch and Product Upgrade Units to produce naphtha and diesel fuel. Liquid fuels are transferred to a tank farm consisting of above-ground storage tanks. Excess syngas and stream generated by the gasification process will be transferred to a combined cycle plant to produce electricity.

The company has declared that the process operations performed at this facility are classified by the Standard Industrial Classification (SIC) codes 2869, "Organic Chemicals". Discharges resulting from process operations do not appear to be covered directly by any established Federal Effluent Guideline regulations.

Description of Proposed Discharge

The draft permit contains two final outfalls that discharge to the Ohio River at the same point. Outfall 001 contains most of the plant discharges, and outfall 002 contains plant stormwater. Outfall 002 is treated by settling before discharge. The sources of wastewater and treatment systems for outfall 001 are shown in the table below.

Outfall 001 is a combination of the cooling tower blowdown and settling basin discharges. The cooling tower blowdown makes up 75-80% of the 001 effluent volume. The cooling tower blowdown would be treated by de-chlorination. The total effluent volume would be 9.7 million gallons per day (MGD).

Two industrial process wastewaters would be generated by this plant – coal-to-liquid wastewaters and by-product processing wastewaters. The coal-to-liquid wastewaters are processed through a reverse osmosis (RO) unit. The concentrated waste from this process is evaporated, leaving a solid waste. The evaporated water is treated through a second RO unit, along with water purchased from Buckeye Water System. The reject from this RO unit is sent to the settling basin.

By-product wastewaters will be treated in a biological wastewater unit; oil removal may be a part of this treatment system if OEPA's Permit-to-Install review finds it necessary. Most of the biological effluent (2.76 MGD) will be used as make-up water for the cooling tower; a small portion (approximately 0.0015 MGD) would overflow to the settling basin.

Other process wastewaters generated at this plant would be water treatment processes, plant and equipment drains, and coal pile runoff. Water taken in from the Ohio River for cooling purposes would be treated by clarification. Wastewater from the clarification process would be sent to the settling basin for further treatment.

Equipment drains would be treated with an oil water separator, and then discharged to the settling basin; coal pile runoff would be treated by a settling pond. Effluent from the pond may be treated in the RO/evaporation system with the coal-to-liquids process wastewater, or may be discharged to Outfall 001.

The draft permit contains monitoring and limits at internal stations 601-607. Effluent limits are applied at these outfalls to ensure that treatment standards are met prior to combining with other wastestreams. If monitoring was not done at this location, it would not be possible to verify compliance with these standards due to dilution. Federal rules [40 CFR 125.3(f)] prohibit attaining treatment standards by dilution. Internal monitoring stations are: settling basin (601), oil/water separator (602), coal pile runoff (603), biological treatment plant (604), RO effluent (605), boiler blowdown (power block – 606) and chemical metal cleaning wastewater (607).

Table 1 presents predicted chemical concentrations for the wastestreams tributary to outfall 001. This information is from the company's NPDES application.

Receiving Water Quality / Environmental Hazard Assessment

According to the 2006 biennial assessment prepared by the Ohio River Valley Water Sanitation Commission (ORSANCO), the Ohio River in this segment attains the public water supply use and the aquatic life use; the river is impaired for recreation use and fish consumption uses. For details, see ORSANCO's report at:

http://www.orsanco.org/rivinfo/305b.asp

Development of Water-Quality-Based Effluent Limits

Determining appropriate effluent concentrations is a multiple-step process in which parameters are identified as likely to be discharged by a facility, evaluated with respect to Ohio water quality criteria, and examined to determine the likelihood that the existing effluent could violate the calculated limits.

Parameter Selection

Effluent data for Ohio River Clean Fuels were used to determine what parameters should undergo wasteload allocation. The parameters discharged are identified by the data available to Ohio EPA - Monthly Operating Report (MOR) data submitted by the permittee, compliance sampling data collected by Ohio EPA, and any other data submitted by the permittee, such as priority pollutant scans required by the NPDES application or by pretreatment, or other special conditions in the NPDES permit. The sources of effluent data used in this evaluation are as follows:

Effluent guidelines for the Iron and Steel Industry - Cokemaking (40 CFR 420)
Effluent guidelines for the Petroleum Refining Industry (40 CFR 419)
Effluent guidelines for the Organic Chemicals, Plastics and Synthetic Fibers Industry (40 CFR 414)
NPDES Application data (2007)
Ohio River background data (parameters that may be concentrated by facility recycling)

Wasteload Allocation

For those parameters that were given a wasteload allocation (WLA), the results are based on the uses assigned to the receiving waterbody in OAC 3745-1. Dischargers are allocated pollutant loadings/concentrations based on the Ohio Water Quality Standards (WQS - OAC 3745-1). Most pollutants are allocated by a mass-balance method because they do not degrade in the receiving water. Wasteload allocations using this method are done using the following general equation: Discharger WLA = (downstream flow x WQS) - (upstream flow x background concentration). Discharger WLAs are divided by the discharge flow so that the WLAs are expressed as concentrations.

The applicable waterbody uses for this facility's discharge and the associated stream design flows are as follows:

Aquatic life (WWH)		
Toxics (metals, organics, etc.)	Average	Annual 7Q10
	Maximum	Annual 7Q10
Agricultural Water Supply		Harmonic mean flow
Human Health (nondrinking)		Harmonic mean flow

Allocations are developed using a percentage of stream design flow (as specified in Table 8), and allocations cannot exceed the Inside Mixing Zone Maximum criteria.

The data used in the WLA are listed in Tables 7 and 8. The wasteload allocation results to maintain all applicable criteria are presented in Tables 9 and 10.

Reasonable Potential

The preliminary effluent limits are the lowest average WLA (average PEL) and the maximum WLA (maximum PEL). To determine the reasonable potential of the discharger to exceed the WLA for each parameter, the facility's effluent quality is compared to the preliminary effluent limits. The average PEQ value (Table 6) is compared to the average PEL, and the maximum PEQ value is compared to the maximum PEL. Based on the calculated percentage of the respective average and maximum comparisons, the parameters are assigned to "groups", as listed in Tables 11 and 12.

Whole Effluent Toxicity WLA

Whole effluent toxicity or "WET" is the total toxic effect of an effluent on aquatic life measured directly with a toxicity test. Acute WET measures short term effects of the effluent while chronic WET measures longer term and potentially more subtle effects of the effluent.

Water Quality Standards for WET are expressed in Ohio's narrative "free from" WQS rule (OAC 3745-1-04(D)). These "free froms" are translated into toxicity units (TUs) by the associated WQS Implementation Rule (OAC 3745-2-09). Wasteload allocations can then be calculated using TUs as if they were water quality criteria.

The wasteload allocation calculations for WET are similar to those for aquatic life criteria (using the chronic toxicity unit (TU_c) and 7Q10 for average and the acute toxicity unit (TU_a) and 1Q10 for maximum). These values are the levels of effluent toxicity that should not cause instream toxicity during critical low-flow conditions. For Ohio River Clean Fuels, the wasteload allocation values are 1.0 TU_a and 40 TU_c.

The chronic toxicity unit (TU_c) is defined as 100 divided by the IC_{25}:

$$TU_c = \frac{100}{IC_{25}}$$

This equation applies outside the mixing zone for warmwater, modified warmwater, exceptional warmwater, coldwater, and seasonal salmonid use designations except when the following equation is more restrictive (Ceriodaphnia dubia only):

$$TUc = \frac{100}{\text{geometric mean of NOEC and LOEC}}$$

The acute toxicity unit (TU_a) is defined as 100 divided by the LC50 for the most sensitive test species:

$$TU_a = \frac{100}{LC50}$$

This equation applies outside the mixing zone for warmwater, modified warmwater, exceptional warmwater, coldwater, and seasonal salmonid use designations.

Effluent Limits/Hazard Management Decisions

Federal and State laws/regulation require that dischargers meet both treatment technology-based limits and any more stringent standards needed to comply with state WQS. Permit limits are based on the more restrictive of the two. The listing in Table 4 reflects the hazard assessment (or "groupings") done according to WLA procedures. Tables 5-9 show the draft NPDES limits for Ohio River Clean Fuels. The draft limits include consideration of treatment technology-based limits, whole effluent toxicity reasonable potential evaluations and other portions of NPDES rules, as well as the water quality-based limits.

Outfall 001
Limits at this outfall are all water-quality based. Limits are included for chlorine, cobalt, free cyanide and mercury because these pollutants are likely to be present at least at trace levels in the discharge due to residual (post-treatment) process wastewater concentrations; limits are included for cadmium, copper and zinc because: (1) these are common pollutants in the environment that may be concentrated by wastewater recycling/reuse in the plant, (2) these pollutants have relatively low wasteload allocations, and (3) there may be process water sources of these pollutants.

Limits proposed for pH and mercury are based on Water Quality Standards (OAC 3745-1). Mercury water quality standards are included as end-of-pipe limits, without a dilution allowance, because Ohio WQS Implementation Rules do not allow mixing zones for new sources of mercury and other bioaccumulative chemicals of concern [OAC 3745-2-05(A)(2)(e)]. Mercury is known to be present in coal, and may be present in plant wastewaters.

Proposed limits for chlorine, cobalt, cadmium, copper, free cyanide and zinc are based on the wasteload allocation as limited by the inside mixing zone maximum (IMZM). The IMZM is a value calculated to avoid rapidly lethal conditions in the effluent mixing zone. The IMZM value is more restrictive than wasteload allocations to meet outside-mixing-zone standards in the Ohio River (see Table 4).

Chlorine and cobalt would be used in treatment and the facility process, respectively. Free cyanide, copper and zinc may be present due to process contaminants or piping materials.

Monitoring requirements for several other pollutant parameters are included as a check to ensure that effluent concentrations are low with respect to water quality standards.

The draft NPDES permit contains a maximum toxicity limit of 1.0 TUa. This limit is included to control toxicity from the discharge as a whole. Cooling towers and materials refining discharges can contain toxic concentrations of total dissolved solids (salts) if not managed carefully. The macroinvertebrates that form a significant part of fish diets are particularly susceptible to TDS-related toxicity. As Ohio has no maximum standard for TDS, acute toxicity limits are needed to ensure that the no-rapid-lethality narrative WQS is met.

Outfall 002
Proposed limits for total suspended solids are Best Professional Judgment (BPJ) of BADCT, based on the storm water pond design. Limits for pH are based on WQS.

Other monitoring requirements are included to ensure that other common contaminants are not present in concentrations that exceed WQS.

Outfall 601
The limits for total suspended solids are BPJ limits based on New Source Performance Standards for the Steam Electric Power Industry (40 CFR 423). Most of the inputs to this pond are wastestreams that would be considered Low Volume Wastewaters under this rule.

Monitoring for other pollutant parameters common to the power industry are also included at this outfall.

Outfall 602
Proposed limits for oil and grease are BPJ limits based on NSPS for Low Volume Wastewaters for the Steam Electric Power Industry. Limits are imposed at this point, rather than at outfall 601, because this wastewater is the only significant input to the settling basin that contains treatable concentrations of oil and grease.

Outfall 603
Proposed limits for total suspended solids are BPJ limits based on NSPS for coal pile runoff in the Steam Electric Power Industry treatment standards.

Outfall 604
The limits at this outfall are all BPJ limits for the biological plant. While this wastewater is related to petroleum refining and organic chemical wastewater, it is not subject to the federal treatment standards for either industry. Because both sets of federal standards are based on biological treatment, these standards were used as a BPJ basis for certain of the limitations at this outfall. Other limits were based on the company's Application Form 2D data as representative of the BADCT pollutant levels achievable by biological treatment systems. The Attachment to this fact sheet contains information related to the development of these limits.

Proposed limits for chemical oxygen demand (COD) and total suspended solids (TSS are based on the application data. For these pollutants, the average values shown in the application were accepted as BADCT for 30-day limits. The maximum limits were derived using effluent limit derivation techniques from USEPA's Technical Support Document for Water Quality Based Toxics Control. The 30-day limits were converted to necessary long-term average concentrations by dividing by 1.4, and then calculated a daily maximum limit by multiplying the LTA by 3.11 to get the 99th percentile value of a standard log-normal distribution. (See TSD for Water Quality Based Toxics Control, page 103. The 1.4 divisor assumes a standard CV=0.6 and 8/samples per month. The 3.11 multiplier assumes a standard CV=0.6). USEPA recommends using the 99th percentile for maximum treatment technology limits.

OEPA based the BOD standards on USEPA's Organic Chemical, Plastics and Synthetic Fibers NSPS standards as the closest approximation to this industry. Specifically we used Subpart F – Commodity Organic Chemicals because this subcategory includes pyrolysis gasolines. For similar reasons, we used the total cyanide and organics limitations from the OCPSF regulation (Subpart I – limits for biological treatment systems).

The OCPSF rules do not limit oil & grease and phenolics, two pollutants that are likely to be present in treated wastewaters from this process. To develop performance standards for these pollutants, we looked at a petroleum refinery limited by treatment technology (BP Oil in Toledo). To account for potential differences in process water usage between the plants, we divided the loading limits for the plant by the 2002-07 average flow of 7.37 MGD to get concentration-based performance standards for these pollutants, which were applied to this discharge as BPJ of BADCT.

The OCPSF rules also do not address ammonia-nitrogen, which the application shows will be present in treated wastewaters at significant concentrations. To develop limits for ammonia, we reviewed data for biological treatment facilities at petroleum refineries. The draft limits in this permit are considered an upper bound for these treatment systems.

The application data indicates that nitrate/nitrite-N concentrations at this discharge would be very high. Nitrogen concentrations in major Mississippi River tributaries are a concern due to hypoxia in the Gulf of Mexico. Ohio has been building practicable levels of control into plans for biological wastewater treatment systems to take steps to address this issue. The effluent limits for total nitrogen are considered to be BADCT controls for biological waste treatment processes; these processes include oxic/anoxic zones within the treatment plant to first convert ammonia and organic nitrogen into nitrate/nitrite-N, and then convert nitrate/nitrite-N to elemental nitrogen gas.

Outfall 605
This wastewater comes from the coal gasification process. The effluent limits are based on the same considerations as those for Outfall 604; the application data shows that organic chemicals may be present in this wastewater at treatable concentrations. As a result, the draft permit contains BPJ limits for hydrocarbon chemicals that may be present in a coking type of wastewater. The limits are based on OCPSF New Source Performance Standards for non-biological treatment systems. While the company has not specified a treatment system for this wastewater yet, the flow diagrams in the application do not show this wastestream going through biological treatment; therefore, the non-biological treatment limits are appropriate until a permit-to-install and NPDES modification change the proposal.

Limits for suspended solids were not included because the wastewater is further treated in the settling pond, and limits for TSS apply at that point.

Outfalls 606 and 607
The limits for these outfalls are BPJ treatment technology limits from the Steam Electric Power effluent guidelines. These wastewaters correspond to Low Volume wastewater, and Chemical Metal Cleaning wastewater, respectively.

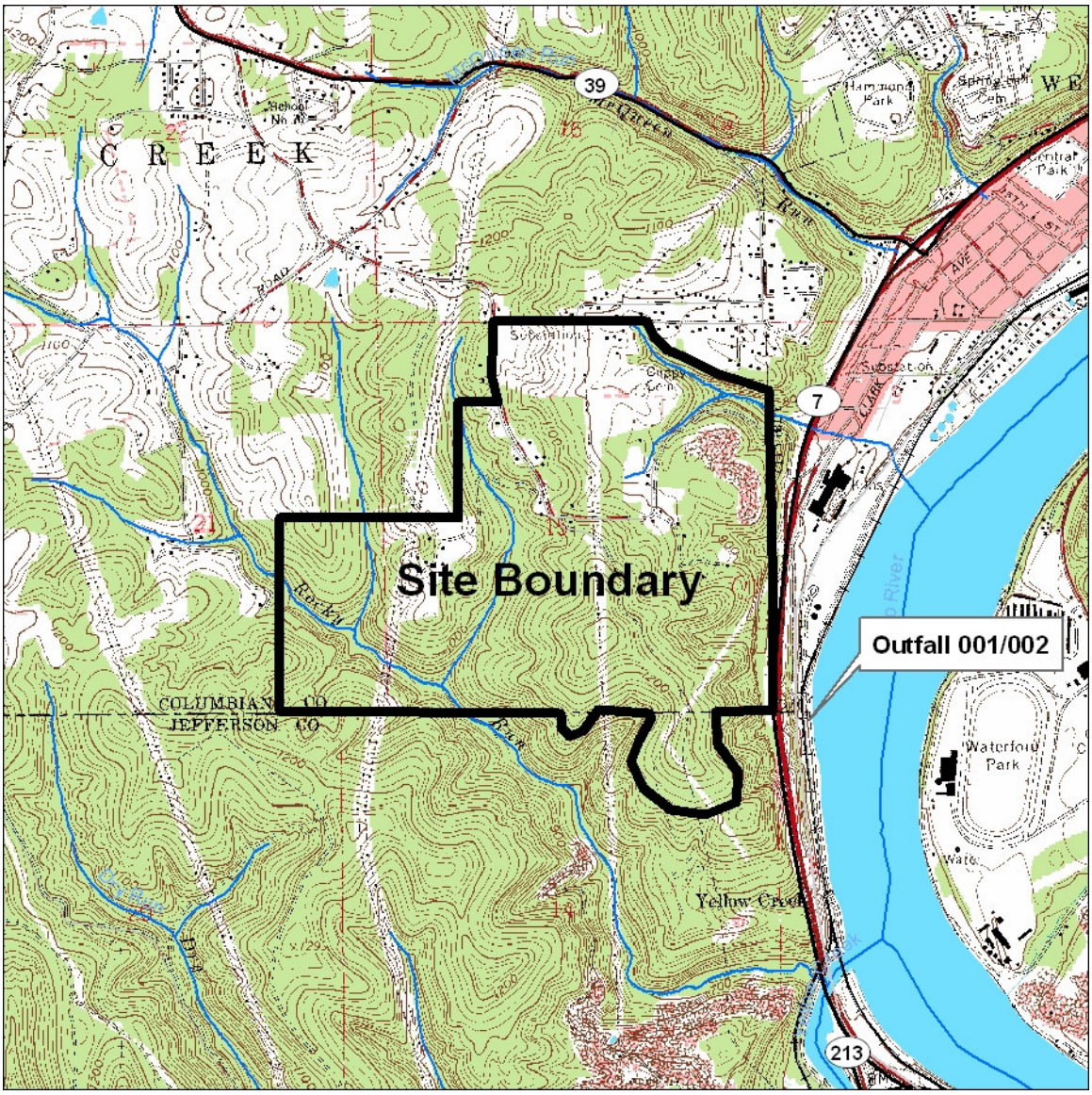


Figure 1. Approximate location of Ohio River Clean Fuels.

Table 1. Effluent Characterization

Summary of the projected quality of Ohio River Clean Fuels wastestreams. All values are in ug/l unless otherwise indicated. All data from application form 2D; NR = not reported.

PARAMETER	Final Discharge	Cooling Tower	Settling Basin	Water Treatment	Biological Treatment	Oil/Water Separator	Rev. Os. Discharge
COD mg/l	NR	4	NR	NR	43	NR	NR
Organic Carbon mg/l	10	0.2	44	NR	58	1.8	63
Suspended Solids mg/l	50	14	170	314	30	5	1500
Dissolved Solids mg/l	420	421	416	NR	11	250	588
Chloride mg/l	34	36	28	NR	0	14	40
Sulfate mg/l	121	99	191	NR	16	95	271
Ammonia-N mg/l	NR	2.0	NR	NR	20	NR	NR
Nitrate/Nitrite-N mg/l	NR	35	NR	NR	350	NR	NR
Chlorine mg/l	0.15	0.2	NR	NR	NR	NR	NR
Antimony	NR	NR	NR	NR	NR	NR	11
Arsenic	NR	NR	NR	NR	NR	NR	152
Cadmium	0	0	NR	NR	0	NR	1.1
Chromium	0	0	NR	NR	0	NR	293
Copper	0	0	NR	NR	0	NR	114
Iron	97	0.1	421	NR	8.2	24	594
Lead	0	0	NR	NR	0	NR	77
Nickel	0	0	NR	NR	0	NR	143
Selenium	0	0	NR	NR	NR	NR	11
Zinc	0	0	NR	NR	0	NR	231
Volatile Organics	0	0	NR	NR	NR	NR	29371
Semi-Volatile Organics	0	0	NR	NR	0	NR	29371

Table 2. **Water Quality Criteria in the Study Area**

Parameter	Units	Outside Mixing Zone Criteria: Average: Human Health	Outside Mixing Zone Criteria: Average: Agri-culture	Outside Mixing Zone Criteria: Aquatic Life	Outside Mixing Zone Criteria: Maximum Aquatic Life	Inside Mixing Zone Maximum
Ammonia-S	mg/l	--	--	1.8	--	33.9
Ammonia-W	mg/l	--	--	7.6	--	44.0
Antimony	ug/l	14	--	190	900	1800
Arsenic - TR	ug/l	50	100	150	340	680
Barium	ug/l	--	--	220	2000	4000
Benzene	ug/l	12c	--	160	700	1400
Beryllium	ug/l	16	100	15	130	250
Boron	ug/l	--	--	950	8500	17000
Cadmium - TR	ug/l	--	50	2.8	5.5	11
Chlorides	mg/l	250	--	--	--	--
Chlorine (wwh) - TRes	mg/l	--	--	0.011	0.019	0.038
Chromium - TR	ug/l	--	100	100	2100	4200
Chromium VI - Diss	ug/l	--	--	11	16	31
Cobalt	ug/l	--	--	24	220	440
Copper - TR	ug/l	1300	500	11	17	33
Cyanide - free	mg/l	0.7	--	0.0052	0.022	0.044
Dissolved solids (ave)	mg/l	--	--	1500	--	--
Ethylbenzene	ug/l	3100	--	61	550	1100
Fluorene	ug/l	1300	--	19	110	220
Fluoride	mg/l	1	2	--	--	--
Iron - TR	ug/l	--	5000	--	--	--
Lead - TR	ug/l	--	100	8.1	150	310
Manganese - TR	ug/l	--	--	--	--	--
Mercury - TR (BPO)	ug/l	0.012	10	0.91	1.7	3.4
Mercury - TR (APO)	ug/l	0.012	10	0.91	1.7	3.4
Molybdenum	ug/l	--	--	20000	190000	370000
Naphthalene	ug/l	--	--	21	170	340
Nickel - TR	ug/l	610	200	61	550	1100
Nitrate-N + Nitrite-N	mg/l	10	100	--	--	--
Phenanthrene	ug/l	--	--	2.3	31	61
Phenol (wwh)	ug/l	21000	--	400	4700	9400
Phenolics	ug/l	5	--	--	--	--
Selenium - TR	ug/l	170	50	5	--	--
Silver (wwh)	ug/l	50	--	1.3	2.2	4.4
Strontium	ug/l	--	--	5300	48000	95000
Sulfates	mg/l	250	--	--	--	--

Table 2. **Water Quality Criteria in the Study Area**

Parameter	Units	Outside Mixing Zone Criteria				Inside Mixing Zone Maximum
			Average		Maximum	
		Human Health	Agri-culture	Aquatic Life	Aquatic Life	
Sulfide	mg/l	--	--	--	--	--
Toluene	ug/l	6800	--	62	560	1100
Xylenes	ug/l	--	--	27	240	480
Zinc - TR	ug/l	9100	25000	140	140	280

Table 3. **Instream Conditions and Discharger Flow**

Parameter	Units	Season	Value	Basis
Stream Flows				
1Q10	cfs	annual	5880	ORSANCO
7Q10	cfs	annual	5880	ORSANCO
		summer	5880	ORSANCO
		winter	5880	ORSANCO
30Q10	cfs	summer	5880	ORSANCO
		winter	5880	ORSANCO
Harmonic Mean	cfs	annual	20500	ORSANCO
Mixing Assumption	%	average	10	(WLAs for non-carcinogens use 100% of the 7Q10.)
	%	maximum	1	
Hardness	mg/l	annual	120	STORET
pH	S.U.	summer	7.6	STORET
		winter	7.5	STORET
Temperature	C	summer	22.5	BWQR
		winter	4	BWQR
Ohio River Clean Fuels flow	cfs	annual	15	Application Form 2D
Background Water Quality				
Ammonia-S	mg/l		0.06	STORET; ; n=14; 3<MDL; New Cumberland Dam median
Ammonia-W	mg/l		0.085	STORET; ; n=6; 2<MDL; New Cumberland Dam mean
Antimony	ug/l		0	No representative data available.
Arsenic - TR	ug/l		0	STORET; ; n=19; 19<MDL; New Cumberland Dam - all <MDL
Barium	ug/l		40	STORET; ; n=19; 0<MDL; New Cumberland Dam median
Benzene	ug/l		0	No representative data available.
Beryllium	ug/l		0	No representative data available.
Boron	ug/l		0	No representative data available.
Cadmium - TR	ug/l		0	STORET; ; n=39; 39<MDL; New Cumberland Dam - all <MDL
Chlorides	mg/l		22	BWQR; ; n=2879; 0<MDL; Statewide median

Background Water Quality

Chlorine (wwh) - TRes	mg/l	0	No representative data available.
Chromium - TR	ug/l	0	STORET; ; n=19; 19<MDL; New Cumberland Dam - all <MDL
Chromium VI - Diss	ug/l	0	No representative data available.
Cobalt	ug/l	0	No representative data available.
Copper - TR	ug/l	2.5	STORET; ; n=39; 31<MDL; New Cumberland Dam median
Cyanide - free	mg/l	0	No representative data available.
Dissolved solids (ave)	mg/l	382	BWQR; ; n=3755; 0<MDL; Statewide median
Ethylbenzene	ug/l	0	No representative data available.
Fluorene	ug/l	0	No representative data available.
Fluoride	mg/l	0	No representative data available.
Iron - TR	ug/l	690	STORET; ; n=39; 0<MDL; New Cumberland Dam median
Lead - TR	ug/l	1	STORET; ; n=39; 30<MDL; New Cumberland Dam median
Manganese - TR	ug/l	140	STORET; ; n=39; 0<MDL; New Cumberland Dam median
Mercury - TR (BPO)	ug/l	0	No representative data available.
Mercury - TR (APO)	ug/l	0	No representative data available.
Molybdenum	ug/l	0	No representative data available.
Naphthalene	ug/l	0	No representative data available.
Nickel - TR	ug/l	0	No representative data available.
Nitrate-N + Nitrite-N	mg/l	0.95	STORET; ; n=39; 0<MDL; New Cumberland Dam median
Phenanthrene	ug/l	0	No representative data available.
Phenol (wwh)	ug/l	0	No representative data available.
Phenolics	ug/l	0	STORET; ; n=39; 39<MDL; New Cumberland Dam - all <MDL
Selenium - TR	ug/l	0	STORET; ; n=19; 19<MDL; New Cumberland Dam - all <MDL
Silver (wwh)	ug/l	0	STORET; ; n=19; 19<MDL; New Cumberland Dam - all <MDL
Strontium	ug/l	0	No representative data available.
Sulfates	mg/l	63	STORET; ; n=39; 0<MDL; New Cumberland Dam median
Sulfide	mg/l	0	No representative data available.
Toluene	ug/l	0	No representative data available.
Xylenes	ug/l	0	No representative data available.
Zinc - TR	ug/l	22	STORET; ; n=39; 12<MDL; New Cumberland Dam median

Table 4. Summary of Effluent Limits to Maintain Applicable WQ Criteria

		Outside Mixing Zone Criteria				Inside
		Average			Maximum	Mixing
		Human	Agri-	Aquatic	Aquatic	Zone
Parameter	Units	Health	culture	Life	Life	Maximum
Ammonia-S	mg/l	--	--	70.0	--	33.9
Ammonia-W	mg/l	--	--	302	--	44.0
Antimony	ug/l	5502	--	7638	4428	1800
Arsenic - TR	ug/l	19650	13767	6030	1673	680
Barium	ug/l	--	--	7276	9683	4000
Benzene	ug/l	1652	--	6432	3444	1400
Beryllium	ug/l	6288	13767	603	640	250
Boron	ug/l	--	--	38190	41820	17000
Cadmium - TR	ug/l	--	6883	113	27	11
Chlorides	mg/l	89626	--	--	--	--
Chlorine (wwh) - TRes	mg/l	--	--	0.44	0.093	0.038
Chromium - TR	ug/l	--	13767	4020	10332	4200
Chromium VI - Diss	ug/l	--	--	442	79	31
Cobalt	ug/l	--	--	965	1082	440
Copper - TR	ug/l	509920	68492	344	74	33
Cyanide - free	mg/l	275	--	0.21	0.11	0.044
Dissolved solids (ave)	mg/l	--	--	45326	--	--
Ethylbenzene	ug/l	1218300	--	2452	2706	1100
Fluorene	ug/l	510900	--	764	541	220
Fluoride	mg/l	393	275	--	--	--
Iron - TR	ug/l	--	594033	--	--	--
Lead - TR	ug/l	--	13630	286	734	310
Manganese - TR	ug/l	--	--	--	--	--
Mercury - TR (BPO)	ug/l	4.7	1377	37	8.4	3.4
Mercury - TR (APO)	ug/l	0.012	10	0.91	1.7	3.4
Molybdenum	ug/l	--	--	804000	934800	370000
Naphthalene	ug/l	--	--	844	836	340
Nickel - TR	ug/l	239730	27533	2452	2706	1100
Nitrate-N + Nitrite-N	mg/l	3558	13637	--	--	--
Phenanthrene	ug/l	--	--	92	153	61
Phenol (wwh)	ug/l	8253000	--	16080	23124	9400
Phenolics	ug/l	1965	--	--	--	--
Selenium - TR	ug/l	66810	6883	201	--	--
Silver (wwh)	ug/l	19650	--	52	11	4.4
Strontium	ug/l	--	--	213060	236160	95000
Sulfates	mg/l	73554	--	--	--	--
Sulfide	mg/l	--	--	--	--	--
Toluene	ug/l	2672400	--	2492	2755	1100

Table 4. Summary of Effluent Limits to Maintain Applicable WQ Criteria

Parameter	Units	Outside Mixing Zone Criteria				Inside Mixing Zone Maximum
			Average		Maximum	
		Human Health	Agri-culture	Aquatic Life	Aquatic Life	
Xylenes	ug/l	--	--	1085	1181	480
Zinc - TR	ug/l	3567676	3438660	4766	603	280

Table 5. Final effluent limits and monitoring requirements for Ohio River Clean Fuels outfall 3IG00097001 and the basis for their recommendation.

		Effluent Limits				
		Concentration		Loading (kg/day)[a]		
Parameter	Units	30 Day Average	Daily Maximum	30 Day Average	Daily Maximum	Basis[b]
Flow	MGD	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - -		M[c]
Temperature	°C	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - -		M[c]
Dissolved Oxygen	mg/l	--	5.0 min.	--	--	WQS
$CBOD_5$	mg/l	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - -		M[c]
COD	mg/l	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - -		M[c]
Dissolved Solids	mg/l	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - -		M[c]
Suspended Solids	mg/l	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - -		M[c]
Ammonia-N	mg/l	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - -		M[c]
Nitrate/Nitrite-N	mg/l	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - -		M[c]
Tot. Kjeldahl N	mg/l	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - -		M[c]
Phosphorus, T.	mg/l	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - -		M[c]
pH	S.U.	- - - - - - - - - - - - -	6.5 to 9.0	- - - - - - - - - - - - -		WQS
Chlorine Residual	mg/l	--	0.038	--	--	WLA/IMZM
Cyanide, Free	mg/l	--	0.044	--	1.61	WLA/IMZM
Cadmium, T. R.	µg/l	--	11	--	0.40	WLA/IMZM
Cobalt, T. R.	µg/l	--	440	--	16.2	WLA/IMZM
Copper, T. R.	µg/l	--	33	--	1.21	WLA/IMZM
Lead, T. R.	µg/l	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - -		M[c]
Mercury, T.	ng/l	12	1700	0.0018	0.062	WLA
Selenium, T. R.	µg/l	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - -		M[c]
Zinc, T. R.	µg/l	--	280	--	10.3	WLA/IMZM
Whole Effluent Toxicity						
Acute	TUa	--	1.0	--	--	WET

[a] Effluent loadings based on average design discharge flow of 9.7 MGD.

[b] Definitions: M = Monitoring; WET = Whole Effluent Toxicity (OAC 3745-33-07(B)) ; WLA = Wasteload Allocation procedures (OAC 3745-2); WLA/IMZM = Wasteload Allocation limited by Inside Mixing Zone Maximum; WQS = Ohio Water Quality Standards (OAC 3745-1).

[c] Monitoring of flow and other indicator parameters is specified to assist in the evaluation of effluent quality and treatment plant performance.

Table 6. Final effluent limits and monitoring requirements for Ohio River Clean Fuels outfall 3IG00097002 and the basis for their recommendation.

		Effluent Limits				
		Concentration		Loading (kg/day)[a]		
Parameter	Units	30 Day Average	Daily Maximum	30 Day Average	Daily Maximum	Basis[b]
Flow	MGD	- - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - -		M[c]
Precipitation	Inches	- - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - -		M[c]
COD	mg/l	- - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - -		M[c]
Suspended Solids	mg/l	30	45	--	--	BPJ
Ammonia-N	mg/l	- - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - -		M[c]
Oil and Grease	mg/l	--	10	--	--	WQS
pH	S.U.	- - - - - - - - - - -	6.5 to 9.0	- - - - - - - - - - - - - -		WQS
Cyanide, Free	mg/l	- - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - -		M[c]
Copper, T. R.	µg/l	- - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - -		M[c]
Zinc, T. R.	µg/l	- - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - -		M[c]

[a] Effluent loadings based on average design discharge flow of N/A MGD.

[b] Definitions: BPJ = Best Professional Judgment (sediment pond design); M = Monitoring; WQS = Ohio Water Quality Standards (OAC 3745-1).

[c] Monitoring of flow and other indicator parameters is specified to assist in the evaluation of effluent quality and treatment plant performance.

Table 7. Final effluent limits and monitoring requirements for Ohio River Clean Fuels outfall 3IG00097601 (Settling Basin) and the basis for their recommendation.

		Effluent Limits				
		Concentration		Loading (kg/day)[a]		
Parameter	Units	30 Day Average	Daily Maximum	30 Day Average	Daily Maximum	Basis[b]
Flow	MGD	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - -		M[c]
BOD_5	mg/l	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - -		M[c]
Suspended Solids	mg/l	30	100	--	--	BPJ
Ammonia-N	mg/l	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - -		M[c]
Phosphorus	mg/l	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - -		M[c]
Oil and Grease	mg/l	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - -		M[c]
pH	S.U.	- - - - - - - - - - - -	6.0 to 9.0	- - - - - - - - - - - - - -		BPJ
Cyanide, Free	mg/l	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - -		M[c]
Arsenic, T. R.	µg/l	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - -		M[c]
Cadmium, T. R.	µg/l	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - -		M[c]
Cobalt, T. R.	µg/l	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - -		M[c]
Copper, T. R.	µg/l	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - -		M[c]
Lead, T. R.	µg/l	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - -		M[c]
Mercury, T.	ng/l	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - -		M[c]
Nickel, T. R.	µg/l	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - -		M[c]
Selenium, T. R.	µg/l	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - -		M[c]
Silver, T. R.	µg/l	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - -		M[c]
Zinc, T. R.	µg/l	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - -		M[c]

[a] Effluent loadings based on average design discharge flow of N/A MGD.

[b] Definitions: BPJ = Best Professional Judgment; M = Monitoring.

[c] Monitoring of flow and other indicator parameters is specified to assist in the evaluation of effluent quality and treatment plant performance.

Table 8. Final effluent limits and monitoring requirements for Ohio River Clean Fuels outfalls 3IG00097602 (Oil/Water Separator), 3IG00097603 (Coal Pile Runoff Treatment), 3IG00097606 (Boiler Blowdown) and 3IG00073607 (Chemical Metal Cleaning Wastewater), and the basis for their recommendation.

		Effluent Limits				
		Concentration		Loading (kg/day)[a]		
Parameter	Units	30 Day Average	Daily Maximum	30 Day Average	Daily Maximum	Basis[b]
Outfall 602						
Flow	MGD	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - - -		M[c]
Oil and Grease	mg/l	15	20	--	--	BPJ
Outfall 603						
Flow	MGD	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - - -		M[c]
Suspended Solids	mg/l	--	50	--	--	BPJ
Outfall 606						
Flow	MGD	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - - -		M[c]
Suspended Solids	mg/l	30	100	--	--	BPJ
Oil and Grease	mg/l	15	20	--	--	BPJ
Outfall 607						
Flow	MGD	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - - -		M[c]
Suspended Solids	mg/l	30	100	--	--	BPJ
Oil and Grease	mg/l	15	20	--	--	BPJ
Copper, T.	µg/l	1000	1000	--	--	BPJ
Iron, T.	µg/l	1000	1000	--	--	BPJ

[a] Effluent loadings based on average design discharge flow of N/A MGD.

[b] Definitions: BPJ = Best Professional Judgment; M = Monitoring.

[c] Monitoring of flow and other indicator parameters is specified to assist in the evaluation of effluent quality and treatment plant performance.

Table 9. Final effluent limits and monitoring requirements for Ohio River Clean Fuels outfall 3IG00097604 (Biological Treatment System) and the basis for their recommendation.

		Effluent Limits				
		Concentration		Loading (kg/day)[a]		
Parameter	Units	30 Day Average	Daily Maximum	30 Day Average	Daily Maximum	Basis[b]
Flow	MGD	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - -		M[c]
BOD_5	mg/l	30	80	--	--	BPJ
COD	mg/l	43	96	--	--	BPJ
Suspended Solids	mg/l	30	67	--	--	BPJ
Ammonia-N	mg/l	6.5	13	--	--	BPJ
Nitrogen, Kjeldahl	mg/l	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - -		M[c]
Nitrate/Nitrite-N	mg/l	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - -		M[c]
Nitrogen, T.	mg/l	10	20	--	--	BPJ
Phosphorus	mg/l	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - -		M[c]
Oil and Grease	mg/l	12	23	--	--	BPJ
pH	S.U.	- - - - - - - - - - - - -	6.0 to 9.0	- - - - - - - - - - - - -		BPJ
Cyanide, Total	mg/l	0.42	1.2	--	--	BPJ
Phenolics, Total	ug/l	200	470	--	--	BPJ
Cadmium, T. R.	µg/l	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - -		M[c]
Cobalt, T. R.	µg/l	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - -		M[c]
Copper, T. R.	µg/l	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - -		M[c]
Lead, T. R.	µg/l	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - -		M[c]
Mercury, T.	ng/l	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - -		M[c]
Nickel, T. R.	µg/l	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - -		M[c]
Selenium, T. R.	µg/l	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - -		M[c]
Zinc, T. R.	µg/l	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - -		M[c]
Organic Priority Pollutants						
Volatile Fraction	µg/l	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - -		M[c]
Acid Extractables	µg/l	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - -		M[c]
Base/Neutral Ext.	µg/l	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - -		M[c]

[a] Effluent loadings based on average design discharge flow of N/A MGD.

[b] Definitions: BPJ = Best Professional Judgment (see attachment); M = Monitoring.

[c] Monitoring of flow and other indicator parameters is specified to assist in the evaluation of effluent quality and treatment plant performance.

Table 10. Final effluent limits and monitoring requirements for Ohio River Clean Fuels outfall 3IG00097605 (Reverse Osmosis Effluent) and the basis for their recommendation.

		Effluent Limits				
		Concentration		Loading (kg/day)[a]		
Parameter	Units	30 Day Average	Daily Maximum	30 Day Average	Daily Maximum	Basis[b]
Flow	MGD	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - -		M[c]
BOD_5	mg/l	30	80	--	--	BPJ
COD	mg/l	43	96	--	--	BPJ
Suspended Solids	mg/l	30	67	--	--	BPJ
Ammonia-N	mg/l	6.5	13	--	--	BPJ
Nitrogen, Kjeldahl	mg/l	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - -		M[c]
Nitrate/Nitrite-N	mg/l	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - -		M[c]
Phosphorus	mg/l	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - -		M[c]
Oil and Grease	mg/l	12	23	--	--	BPJ
pH	S.U.	- - - - - - - - - - - - -	6.0 to 9.0	- - - - - - - - - - - - -		BPJ
Cyanide, Total	mg/l	0.42	1.2	--	--	BPJ
Phenolics, Total	ug/l	200	470	--	--	BPJ
Cadmium, T. R.	µg/l	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - -		M[c]
Cobalt, T. R.	µg/l	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - -		M[c]
Copper, T. R.	µg/l	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - -		M[c]
Lead, T. R.	µg/l	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - -		M[c]
Mercury, T.	ng/l	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - -		M[c]
Nickel, T. R.	µg/l	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - -		M[c]
Selenium, T. R.	µg/l	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - -		M[c]
Zinc, T. R.	µg/l	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - -		M[c]
Acenaphthene	µg/l	19	47	--	--	BPJ
Acenaphthylene	µg/l	19	47	--	--	BPJ
Anthracene	µg/l	19	47	--	--	BPJ
Benzene	µg/l	57	134	--	--	BPJ
Benzo(a)anthracene	µg/l	19	47	--	--	BPJ
Benzo(a)pyrene	µg/l	20	48	--	--	BPJ
Benzo(b)fluoranthene	µg/l	20	48	--	--	BPJ
Benzo(k)fluoranthene	µg/l	19	47	--	--	BPJ
Chrysene	µg/l	19	47	--	--	BPJ
Ethylbenzene	µg/l	142	380	--	--	BPJ
Fluoranthene	µg/l	22	54	--	--	BPJ
Fluorene	µg/l	19	47	--	--	BPJ
Naphthalene	µg/l	19	47	--	--	BPJ
Phenanthrene	µg/l	19	47	--	--	BPJ
Pyrene	µg/l	20	48	--	--	BPJ
Toluene	µg/l	28	74	--	--	BPJ

Table 10. Final effluent limits and monitoring requirements for Ohio River Clean Fuels outfall 3IG00097605 (Reverse Osmosis Effluent) and the basis for their recommendation.

		Effluent Limits				
		Concentration		Loading (kg/day)[a]		
Parameter	Units	30 Day Average	Daily Maximum	30 Day Average	Daily Maximum	Basis[b]
Other Organic Priority Pollutants						
Volatile Fraction	µg/l	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - - -		M[c]
Acid Extractables	µg/l	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - - -		M[c]
Base/Neutral Ext.	µg/l	- - - - - - - - - - - -	Monitor	- - - - - - - - - - - - - - - -		M[c]

[a] Effluent loadings based on average design discharge flow of N/A MGD.

[b] Definitions: BPJ = Best Professional Judgment; M = Monitoring.

[c] Monitoring of flow and other indicator parameters is specified to assist in the evaluation of effluent quality and treatment plant performance.

Attachment – Development of Effluent Limits for Outfall 604

Oil & Grease:

BP Oil Outfall 601 loading limit (kg/day) / 7.37 MGD / 3.785 liters/gallon =

339 kg/day / 7.37 MGD / 3,785 liters/gal. = 12 mg/l

637 kg/day / 7.37 MGD / 3.785 liters/gal. = 23 mg/l

Total Phenolics:

5.61 kg/day / 7.37 MGD / 3.785 liters/gal. = 0.20 mg/l, or 200 ug/l

13 kg/day / 7.37 MGD / 3.785 liters/gal. = 0.47 mg/l, or 470 ug/l

Data Used in Determining Ammonia-N Limits:

PEQ Data for 2003-07

	Husky Oil / Lima		BP / Toledo		Marathon / Canton	
	Avg.	Max.	Avg.	Max.	Avg.	Max.
Ammonia-N (sum)	1.85	3.48	3.93	4.17	5.73	8.22
Ammonia-N (win)	3.57	6.46	2	3.72	4.58	6.28

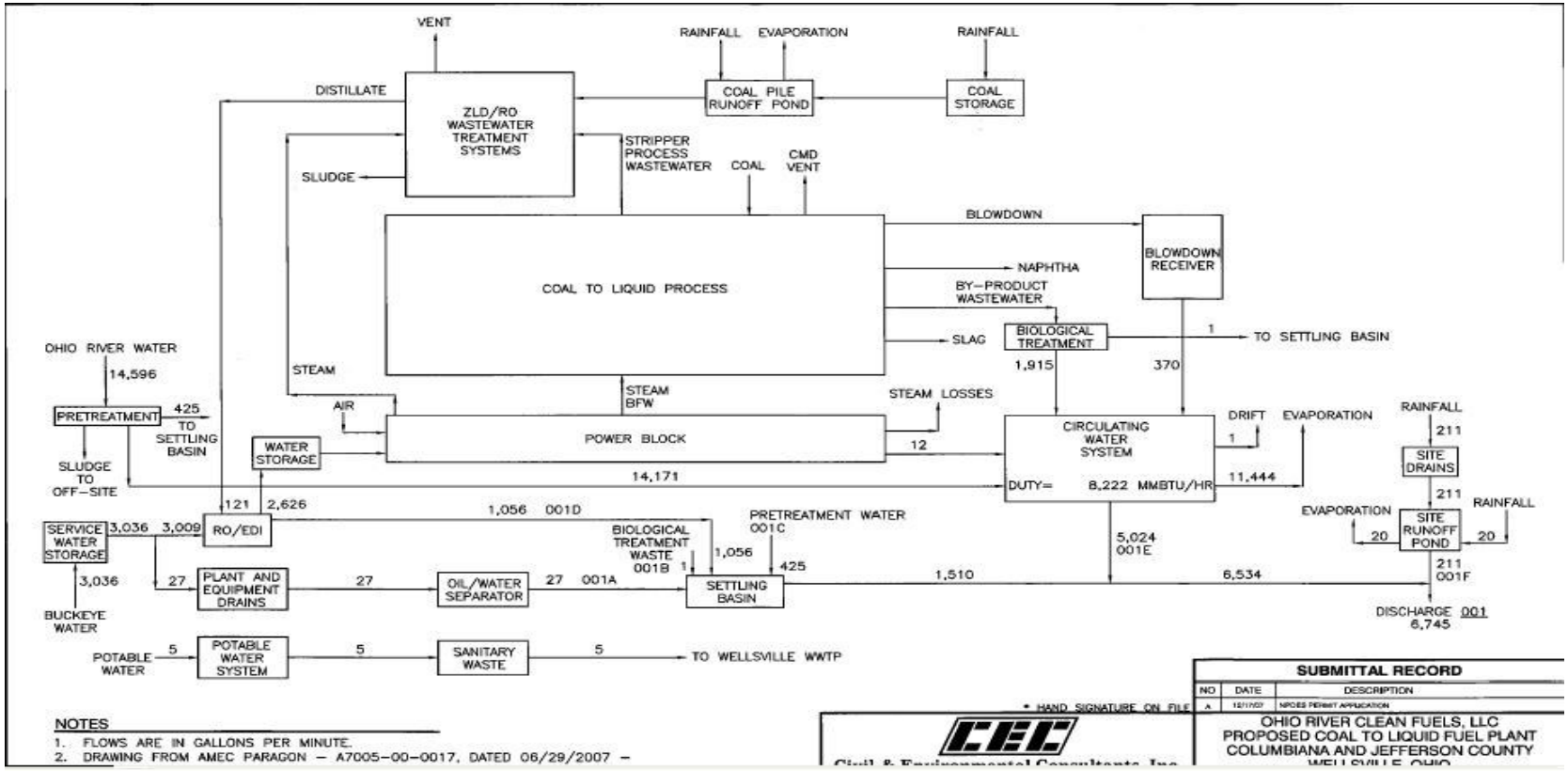
NPDES Application Data

Husky Oil App. Data	Max. Mon.	Daily Max.
Ammonia-N	1.15	4.96
Nitrate/Nitrite-N		0.25
Organic N		1

BP Oil App. Data	Max. Mon.	Daily Max.
Ammonia-N	3.7	8.9
Nitrate/Nitrite-N	1.47	6.35
Organic N		1.2

Marathon App. Data	Max. Mon.	Daily Max.
Ammonia-N	6.1	13
Nitrate/Nitrite-N		0.35
Organic N		3.19

A



Attachment –Water Flow Diagram for Ohio River Clean Fuels