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DEPARTMENT OF THE TREASURY  
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INTERNAL REVENUE SERVICE NATIONAL OFFICE FIELD SERVICE ADVICE

MEMORANDUM FOR DISTRICT COUNSEL,

FROM: Assistant Chief Counsel (Field Service) CC:DOM:FS

SUBJECT: Petroleum Refining Plant Depreciation

This Field Service Advice responds to your memorandum dated June 11, 1999. Field Service Advice is not binding on Examination or Appeals and is not a final case determination. This document is not to be cited as precedent.

LEGEND:

Taxpayer =

ISSUE(S):

1. Whether assets not involving distillation, fractionation, and catalytic cracking of crude petroleum may be reclassified from Class 13.3-Petroleum refining to Class 28.0 - Manufacture of Chemicals and Allied Products.
2. Whether an asset is excluded from MACRS Guideline Class 13.3 if it is used in a process that refines crude oil and produces gasoline and other components of crude oil, but does not involve the processes of "distillation, fractionation, and catalytic cracking of crude petroleum into gasoline and its other components."

### CONCLUSIONS:

1. A processing asset in a petroleum refining plant should be classified under Class 13.3 unless it produces a chemical (not oil or gasoline) sold in sufficient amounts to third party buyers so as to constitute a separate business activity. Recharacterization of an asset from Class 13.3 to Class 28.0 is a change in method of accounting.
2. An asset is not excluded from MACRS Guideline Class 13.3 if it is used in a process that refines crude oil and produces gasoline and other components of crude oil, but does not involve the processes of "distillation, fractionation, and catalytic cracking of crude petroleum into gasoline and its other components."

### FACTS:

Taxpayer owns and operates oil refineries. Taxpayer converts crude oil into refined products, then distributes and markets them. All the assets at issue are located at taxpayer's refining plants.

Taxpayer asserts that certain assets should not be classified as MACRS Guideline Class 13.3 ("Class 13.3") assets<sup>1</sup> for purposes of depreciation. It argues that the assets at issue are not used in "refining (or breaking down and separating) crude petroleum into gasoline or the components of crude petroleum."

Taxpayer claims that the assets fall under MACRS Guideline Class 28.0 ("Class 28.0").<sup>2</sup> It reaches this conclusion by claiming that the assets are used in processes involving the "reforming or building up organic molecules or isolating inorganic molecules."

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<sup>1</sup>Recovery period 10 years.

<sup>2</sup>Recovery period 5 years.

Taxpayer identified the assets used in the following processes as those which fall within MACRS Class 28.0.

Sulfur recovery and production  
 Hydrogen production  
 Isomerization  
 Ether Production (MBTE and TAME)  
 Olefin Splitter  
 Catalytic reformation including naphtha hydrotreaters  
 Alkylation

The following describes the processes set forth above:

**Sulfur Production Processes:**

Assets Used In	Feedstock	Process	Process Output
Acid Plant	H <sub>2</sub> S Gas and spent Sulfuric Acid	Combustion of H <sub>2</sub> S to SO <sub>2</sub> , followed by reaction to Sulfuric Acid	Sulfuric Acid
H <sub>2</sub> S and Amine Treater	Refinery gases containing H <sub>2</sub> S	H <sub>2</sub> S absorption in Amine Solvent followed by Amine regeneration	H <sub>2</sub> S (Hydrogen Sulfide) and Sweet Fuel Gas
Sulfur Recovery Unit	H <sub>2</sub> S Gas	Claus Reaction (burn part of H <sub>2</sub> S to get H <sub>2</sub> S and SO <sub>2</sub> ) to convert H <sub>2</sub> S to elemental Sulfur	Elemental Sulfur (molten)

H<sub>2</sub>S gas is liberated in several processes within a refinery. For example, crude distillation, thermal cracking (vis breaking and coking), catalytic cracking, naphtha reforming, and several hydrodesulfurizing processes. All of these processes liberate sulfur, in the form of H<sub>2</sub>S gas, from crude oil components. Removal of sulfur from crude oil components is necessary to avoid catalytic poisoning and to comply with mandated low sulfur specifications for gasoline and other fuel products. The reduction of sulfur from both refinery environmental emissions and from gasoline, diesel, distillate oils and fuel oil products is legally mandated and must be done in order to continue refining of crude oil. The produced sweet refinery fuel gas is required for refinery emissions compliance. Producing elemental sulfur is a safe and economically practical way to dispose of the sulfur removed from refinery

fuel gas, crude oil components, and refinery fuel products. Production of sulfuric acid, to be used on the refinery's alkylation process is an alternative method for by-product sulfur disposal.

### Hydrogen Production:

Assets Used In	Feedstock	Process	Process Output
Steam/Methane Reformer (SMR)	Natural Gas	Steam Reforming to form H <sub>2</sub> , CO and CO <sub>2</sub> . Catalytic shift of CO to CO <sub>2</sub> and H <sub>2</sub> ; solvent removal of CO <sub>2</sub> to purify H <sub>2</sub>	Hydrogen and byproduct CO <sub>2</sub>
Steam/Naptha Reformer (SNR)	Naptha or Butane	Same as above	Hydrogen and byproduct CO <sub>2</sub>

The taxpayer has several hydrotreating processes that serve the primary purpose of removing sulfur from products produced from components of crude oil. Catalytic reforming of naphtha to produce gasoline blendstock usually produces sufficient hydrogen for desulfurization of reformer feed, plus enough for additional hydrotreating of straight run distillates and some cracked stocks.

The taxpayer has installed catalytic hydrocracking for the purpose of upgrading distillate oil, upgrading catalytic cracker (FCC) feed, and for lube oil manufacture. Addition of hydrocracking to the taxpayer's refineries has required naphtha. The taxpayer installed two additional processes for the production of hydrogen. One process uses natural gas for steam/methane reforming to produce hydrogen; this source of hydrogen comes from non-crude oil sources. The other process uses naphtha or butane for steam/ naphtha reforming for additional hydrogen; this source comes from crude oil sources.

Refinery produced hydrogen satisfies the purpose of economically refining crude oil into finished petroleum products. Neither refinery by-product hydrogen nor manufactured hydrogen is sold to third parties. All produced hydrogen is consumed within the refinery.

**Hydrotreating and Isomerization:**

Assets Used In	Feedstock	Process	Process Output
Naphtha Hydrotreater	Straight Run Naphtha (result of cracking)	Catalytic Hydrogenation of Sulfur Compounds	Hydrobate
Isomerization Unit	Light Hydrobate, Light Reformate, and Light Naphtha	Benzene Saturation and Isomerization Reaction to form branched Paraffins (rearranging parts of the molecule)	Isomerate (used as a gasoline blending additive)

Hydrotreating and Isomerization are refinery activities to improve the properties of intermediate streams and final products traditionally produced by refineries: gasoline, jet fuel, diesel fuel, heating oil and lubricating oil. None of the intermediate streams of final refinery products are utilized in the manufacture of basic organic and inorganic chemicals or chemical products to be used in further manufacture, such as synthetic fibers, plastic materials, and finished chemical products.

**Ether Production - MTBE and TAME:**

Assets Used In	Feedstock	Process	Process Output
MTBE Unit	Methanol and Mixed Butane Olefins	Catalytic Reaction combining Isobutylene and Methanol	MTBE (used for refining and sales to other crude oil refineries)
TAME Unit	Methanol and Mixed Pentane Olefins	Catalytic Reaction combining Isoamylene and Methanol	TAME

TAME and MBTE units produce gasoline additives which are blended into gasoline. The additives are necessary to create marketable motor fuel products which must meet certain government mandated tail pipe emissions standards. Gasoline must

meet specific composition formulas. The goals are the end product of a salable gasoline. Excess MBTE may be sold to other crude oil refineries and is apparently used exclusively for oil refining purposes.

### **Olefin Splitter:**

Assets Used In	Feedstock	Process	Process Output
Olefin Splitter	Propane/propylene mixture	Fractionation	Propane and Propylene

The olefin splitter is used to upgrade a refinery by-product stream to achieve salable propylene stream from the refinery. Propylene results from thermal cracking and catalytic cracking of crude oil components to produce gasoline. Many refineries polymerize propylene with iso-paraffins to produce gasoline blendstocks. Alternatively, local market may exist for propylene at an appropriate purity.

### **Catalytic Reforming:**

Assets Used In	Feedstock	Process	Process Output
Continuous Catalytic Reforming Unit	Hydrobate and Heavy Isomax Gasoline	Catalytic reforming of primarily Naphthenes to Aromatics	Reformat and Hydrogen
Conventional Reformer	Hydrobate and Heavy Isomax Gasoline	Catalytic reforming of primarily Naphthenes to Aromatics	Reformat and Hydrogen

Catalytic reforming is a continuous process to upgrade low-octane naphthas (virgin naphtha, thermally cracked naphtha, or heavy catalytically cracked naphthas) into high octane blendstock for motor and aviation gasoline. At high severities, aromatics (benzene, toluene, xylene—BTX) can be produced for petrochemical use.

Primary catalytic reaction mechanisms are: (1) dehydrogenation of naphthenes, (2) dehydrocyclization of paraffins, (3) paraffin isomerization, (4) dehydriisomerization of naphthenes, (5) paraffin hydrocracking, (6) desulfurization, and (7) olefin saturation.

When a refinery is producing both motor fuel reformat, and aromatics extract, it is not uncommon to operate two reformers. One reformer is operated at low severity and high volume to produce gasoline reformat. The other reformer is volume operated at high severity and lower volume to yield the largest amount of aromatics

(BTX). Aromatics are removed from the reformat in a process that uses extractive distillation or multistage countercurrent extraction or a combination of the two. Udex extraction (licensed by Universal Oil Products) and Sulfolane (developed by Shell Development Co., and licensed by UOP) are examples.

In the past, it was acceptable to have aromatics in gasoline. Consequently it was not necessary to remove aromatics from reformat gasoline. However current EPA regulations require removal of aromatics, particularly benzene. Consequently, benzene extraction is required; alternatively hydrogen is used in a benzene saturation unit to convert the aromatic to cyclohexane.

### Alkylation:

Assets Used In	Feedstock	Process	Process Output
Alkylation Unit	Isobutane, Olefins	Alkylation (building up small/simple molecules into larger/complex molecules)	Alkylate

Alkylation uses refinery run liquids to create chemicals used as gasoline additives. These additives enhance the characteristics of the marketable gasoline products. As taxpayer's description points out, low value refining stream molecules are combined to produce a molecule that has "unique properties of interest to refiners."

### LAW AND ANALYSIS

The Internal Revenue Code allows taxpayers deductions for the exhaustion, wear and tear, or obsolescence of property used in a trade or business. I.R.C. § 167(a). The depreciation system is based on the taxpayer having a depreciable interest in property and a depreciation deduction is dependent on "use" of the depreciable asset in the taxpayer's trade or business. See Kittredge v. Commissioner, 88 F.2d 632, 633-634 (2<sup>nd</sup> Cir. 1937) ("used in the trade or business" applies to use in the **taxpayer's** trade or business)(emphasis supplied)(interpreting a predecessor statute of section 167); Treas. Reg. § 1.167(a)-1(b) ("useful life . . . is the period over which the asset may reasonably be expected to be useful to the taxpayer **in his trade or business.**") (Emphasis supplied); Northern States Power Co. v. United States, 151 F.3d 876 (8<sup>th</sup> Cir. 1998) ("Under the Internal Revenue Code ("I.R.C."), sections 167 and 168, a taxpayer is allowed to claim a depreciation deduction for property it uses in its trade or business."); cf. Norfolk Southern v. Commissioner, 104 T.C. 13, 39 (1995)(discussing "use" in trade or business), aff'd, 140 F.3d 240 (4<sup>th</sup> Cir. 1998).

Under the Modified Accelerated Cost Recovery System ("MACRS"), the depreciation deduction is computed by reference to the applicable depreciation method, recovery period, and convention. I.R.C. § 168(a). MACRS generally applies to tangible property placed in service after December 31, 1986. I.R.C. § 168.

The asset's recovery period depends on the asset's class life. I.R.C. § 168(e). Section 168(i)(1) of the Code provides that an asset's class life means the class life which would have been applicable under former I.R.C. § 167(m)<sup>3</sup>. Former I.R.C. 167(m) provided that (1) a depreciation deduction would be computed based on the class life prescribed by the Secretary and (2) the class life would reasonably reflect the anticipated useful life of the property to the industry or other group.

Treas. Reg. § 1.167 (a)-11(b)(4)(iii)(b) sets out the method for asset classification under former I.R.C. §167(m). The regulations provide that, to determine the appropriate class life of an asset, the property shall be included in the asset guideline class for the activity in which the property is primarily used. This portion of these regulations applies to MACRS.

Treasury issued Revenue Procedure 87-56 ("Rev. Proc. 87-56"), 1987-2 C.B. 674, to describe the various asset classes and set forth "the class lives of property that are necessary to compute the depreciation allowances available under section 168 of the Internal Revenue Code." Two asset classes under this revenue procedure are at issue:

**Class 13.3 - Petroleum Refining.** Includes assets used for distillation, fractionation, and catalytic cracking of crude petroleum into gasoline and its other components. Id. at 678.

Distillation entails boiling to remove lighter components. Fractionation entails segregating a boiled mixture using discrete boiling ranges. Catalytic Cracking means breaking up large/complex molecules into smaller/simpler molecules.

**Class 28.0 - Manufacture of Chemicals and Allied Products.** Includes assets used to manufacture basic organic and inorganic chemicals; chemical products to be used in further manufacture, such as synthetic fibers and plastics materials; and finished chemical products. Includes assets used to further process man-made fibers, to manufacture plastic film, and to manufacture nonwoven fabrics, when such assets are located in the same plant in an integrated operation

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<sup>3</sup> I.R.C. § 167(m) was repealed effective Nov. 5, 1990. Omnibus Budget Reconciliation Act of 1990, §§ 11812(a)(1) and 11812(c), Pub. L. 101-508, 104 Stat. 1388.

with chemical products producing assets. Also includes assets used to manufacture photographic supplies such as film, photographic paper, sensitized photographic paper, and developing chemicals. Includes all land improvements associated with plant site or production processes, such as effluent ponds and canals, provided such land improvements are depreciable but does not include buildings and structural components as defined in section 1.48-1(e) of the regulations. **Does not include assets used . . . in the production of natural gas products, butane, propane, and by-products of natural gas production plants.** (Emphasis supplied). *Id.* at 679.

In general, the asset classes set forth in Rev. Proc. 87-56 describe trade or business activities. Section 167( m) provides in part that the depreciation allowance is based on “the class life prescribed by the Secretary which reasonably reflects the anticipated useful life of that class of property **to the industry or other group.**” (Emphasis supplied). Under this regime the same asset might have a different class if used by a different industry or other group in a different pool of assets having a different average life. *See* S.Rep. No. 437, 92<sup>nd</sup> Cong. 1<sup>st</sup> Sess. 45, 48 (1972-1 C.B. 559, 584-586). The Department of Treasury established the asset classes by trade or business in issuing the applicable revenue procedures as discussed below.

The Secretary first grouped assets into broad industry classes for depreciation purposes in Rev. Proc. 62-21, 1962-2 C.B. 418. In its introduction to Group Three: Guidelines for Manufacturing, Rev. Proc. 62-21 states “[i]n general a single class is specified for each manufacturing industry.” 1962-2 C.B. 418, 422. Specifically, this revenue procedure set class lives:

based on analyses of statistical data and engineering studies and assessments of current and prospective technological advances, for each industry in the United States. The guidelines which [were] developed [were] felt to provide reasonable standards for taxpayers in the various industries . . . .

1962-2 C.B. at 463 (emphasis added).

Even through petroleum refiners and chemical manufacturers may have some assets in common, it was reasonable to prescribe separate class lives for equipment used by petroleum refiners and chemical manufacturers, because these activities have different overall business risks. *See Tennessee Natural Gas Lines v. Commissioner*, 71 T.C. 74, 94 (1978), *acq.* 1979-2 C.B. 2 (components of a liquified natural gas facility, although functionally similar to those found in natural

gas production plants, held not included in class for production plants since taxpayer was not in production plant business).

The regulations acknowledge, however, that a taxpayer can be engaged in more than one trade or business, in which case the activity in which the asset is primarily used controls the asset's classification for depreciation purposes even if that activity is insubstantial in relation to all of the taxpayer's activities. Treas. Reg. § 1.167(a)-11(b)(4)(iii)(b).

To be a separate trade or business activity, the activity must be engaged in for profit. See United States v. American Bar Endowment et al, 477 U.S. 105, 110 n.1 (1986) (trade or business activity is activity engaged in for profit); 4A MERTENS LAW OF FEDERAL INCOME TAXATION § 25.08 (1979)(discussing second trade or business). Thus, in the present case, unless the subject product is expected to be sold in sufficient quantities to generate a profit, it cannot be considered to be a separate business activity for purposes of the class life system.

Based on the above, assets that process components and byproducts of crude oil resulting from the initial distillation, fractionation, and catalytic cracking of crude petroleum are considered part of crude oil refining for purposes of the class life system to the extent the assets are used in the same trade or business.

Consistent with this principle, "refining" under the revenue procedure is not limited to distillation, fractionation and catalytic cracking. Since the revenue procedure "includes" these processes within refining assets, this denotes that the range of assets falling under refining is broader than the three listed processes. Refinery processes also include, as a partial additional list, the following: desulfurization, thermal cracking, hydrocracking, catalytic reforming, isomerization, catalytic polymerization and alkylation, and lubricating oil production. Assets that further process the products of refining may be included in Asset Class 28.0 only if the subsequent processing is a significant activity separate from refining processes. A significant separate activity produces, or is expected to produce, a profit from the production of a product that is not marketed as a component of oil or gasoline. The treatment of waste material from the refining process generally is part of the refining process.

In addition, Asset Class 28.0 specifically excludes assets used in the production of natural gas products, butane, propane and by-products of natural gas production plants. To the extent taxpayer satisfies the criteria for having a separate "trade or business" activity for chemical manufacturing, natural gas products assets should be excluded from Asset Class 28.0 in accordance with this limitation.

If you have any further questions, please call the branch telephone number.

By: \_\_\_\_\_  
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