



# Overview of EPA's Tier 3 Gasoline Sulfur Regulations

40 CFR Part 80, Subparts D, E, H and O (mostly O)

September 20, 2016



# Regulated Parties Under Tier 3

- Gasoline refiners (separate regulatory provisions for the following refiner subcategories)
  - Small refiners
  - Small volume refineries
  - Transmix processors
  - Transmix blenders
  - Butane blenders
  - Pentane blenders
- Gasoline importers
- Oxygenate producers
- Oxygenate blenders
- Ethanol denaturant producers and importers
- Gasoline additive manufacturers



# Tier 3 Sulfur Standards for Gasoline Refiners and Importers (80.1603)

- Refiner and importer standards
  - Gasoline must contain no more than 10 parts per million (ppm) sulfur, on an annual average basis, beginning January 1, 2017
  - Gasoline must continue to contain no more than 80 ppm sulfur maximum, on a per-gallon basis
  - Standards apply to each refinery and each importer
- Small refiners and small volume refineries may delay compliance with the standards until January 1, 2020
- Refiners may request temporary relief if experiencing extreme hardship from economic factors or unforeseen circumstances
- Downstream of refineries and import facilities, gasoline must contain no more than 95 ppm sulfur



# Small Refiners and Small Volume Refineries (80.1620 and 80.1621)

- To qualify for the small refiner provisions:
  - Refiner must produce gasoline from crude oil
  - Refiner must have employed no more than 1,500 people, including parent company and all subsidiaries, in 2012
  - Refiner must have processed no more than 155,000 barrels/day crude oil on average in 2012
- To qualify for the small volume refinery provisions:
  - Refinery must produce gasoline from crude oil
  - Refinery must have processed no more than 75,000 barrels/day crude oil on average in 2012
  - Refinery must have been commissioned by 12/31/2012



# Averaging, Banking and Trading (ABT) Provisions (80.1615 & 80.1616)

- ABT provisions are similar to those in EPA's Tier 2 gasoline sulfur regulations, which established a 30 ppm annual average sulfur standard and 80 ppm per-gallon sulfur cap standard for refineries and importers beginning in 2004
- Beginning 1/1/2012, refiners and importers may generate gasoline sulfur credits which can be banked or transferred to other refiners and importers for compliance with either subpart H (Tier 2) through 2016, or subpart O (Tier 3) beginning in 2017
- Credits are measured in ppm-gallons
  - For example, beginning 1/1/2017, a refiner (non-small) or importer who produced or imported 1 gallon of gasoline containing 7 ppm sulfur could generate 3 ppm-gallon sulfur credits
  - A credit generator may bank credits for future usage, or transfer them to another refiner or importer who would use the credits if their annual average gasoline sulfur exceeded 10 ppm sulfur beginning in 2017
- Credits may only be transferred twice between refiners and importers



# Tier 3 Gasoline Sulfur Credit Generation (80.1615)

- Credits may only be generated by refiners and importers
  - “Early” Tier 3 credits may be generated from 1/1/2012 through 12/31/2016 by producing gasoline containing less than 30 ppm sulfur on an annual average basis
  - “Standard” Tier 3 credits may be generated beginning 1/1/2017 by producing gasoline containing less than 10 ppm sulfur on an annual average basis
- Additional credit generation provisions for small volume refineries and small refiners
  - These refineries/refiners may generate Tier 2 credits from 1/1/2017 through 12/31/2019 if their annual average gasoline sulfur is less than 30 ppm, but these credits may only be used by other small refineries/refiners for compliance with subpart H
  - These refineries/refiners may also generate “standard” Tier 3 credits from 1/1/2017 through 12/31/2019 if their annual average gasoline sulfur is less than 10 ppm, these credits may be used by all refiners and importers
- Credit generation prohibited for oxygenate blenders, transmix processors, transmix blenders, butane blenders, and pentane blenders



# Gasoline Sulfur Credit Usage (80.1616)

- Credits are used by refineries or importers whose annual average gasoline sulfur exceeds 10 ppm beginning in 2017
- Credits are valid for use for 5 years after the year of generation, they expire if not used within this lifetime
  - For example, credits generated in 2012 may be used either for compliance with Tier 2's 30 ppm sulfur standard through 2016, or used for compliance with the 10 ppm sulfur standard in 2017 (2012 credits expire if not used through the 2017 compliance period)
- “Early” Tier 3 credits generated in 2014, 2015 and 2016 may be used no later than the 2019 annual compliance period, and expire by 3/31/2020 if unused
- Refineries or importers whose annual average gasoline sulfur exceeds 10 ppm beginning in 2017 are allowed to carry-forward a credit deficit for 1 year, but at the end of the subsequent year must meet the 10 ppm standard for both years



# Sampling and Testing Requirements for Refiners and Importers (80.1630)

- Refiners and importers must continue to sample, test and report the sulfur content of each batch of gasoline which they produce or import
- Refiners and importers may include downstream-blended oxygenate in annual average sulfur compliance calculations, if they comply with requirements of 80.69(a) for RFG/RBOB, or 80.101(d)(4)(ii) for CG/CBOB
  - Must separately sulfur-test both oxygenate, and neat gasoline or BOB into which oxygenate is blended
  - Refiner or importer assumes ethanol contains 5 ppm sulfur if they don't know the actual sulfur concentration of the ethanol blended into their BOB or gasoline
  - Calculate volume-weighted sulfur of batch of gasoline/BOB plus oxygenate, and report calculated sulfur and total volume of batch to EPA
- Refiners and importers may not include downstream-blended oxygenate in complying with the 80 ppm per-gallon standard (i.e., 80 ppm standard applies to neat gasoline or BOB)
- Separate sampling and testing provisions for refiners who produce gasoline through in-line blending, and importers who import gasoline by truck (80.1641)





# Tier 3 Sulfur Standards for Oxygenate Producers and Importers (80.1610)

- Oxygenates (including denatured fuel ethanol) blended into gasoline must meet the following requirements
  - Contain no more than 10 ppm sulfur, on a per-gallon basis
  - Be composed solely of carbon, hydrogen, oxygen, nitrogen and sulfur
- Denatured fuel ethanol must meet the following additional requirements
  - Contain no more than 3 volume percent of all denaturants
  - Only previously certified gasoline, gasoline blendstocks, or natural gas liquids may be used as denaturants
- Ethanol denaturants may be uncertified or certified, certified ethanol denaturant (CED) must contain less than 330 ppm sulfur (80.1611)



# Sampling and Testing Requirements for Oxygenate Producers and Importers (80.1642)

- Oxygenate producers and importers must sample, test and report the sulfur content of each batch of oxygenate which they produce or import (including denatured fuel ethanol containing uncertified denaturant)
- For batches of denatured fuel ethanol produced using certified denaturant, the producer may use the following alternative means of determining the sulfur content of the denatured ethanol
  - Conduct production quality control which demonstrates that the sulfur content of the undenatured ethanol is negligible or may be assumed to be some specific value
  - Obtain the sulfur content of the certified denaturant from the product transfer document for the denaturant
  - Calculate the sulfur content of the denatured fuel ethanol by volume weighting the sulfur contributions of the undenatured ethanol and denaturant



# Additives (80.1613)

- Manufacturers of gasoline additives with a maximum allowed treatment rate of 1 volume percent must meet the following requirements
  - Additive must not increase gasoline sulfur by more than 3 ppm on a per-gallon basis when used at the maximum recommended treatment rate
  - Additive manufacturer must maintain records on additive production quality control procedures demonstrating that their additive sulfur content is consistent with a 3 ppm sulfur contribution at the maximum treatment rate
  - The maximum treatment rate must correspond to the maximum additive concentration registered with EPA



# Registered Parties Under Tier 3 (80.1650)

- Gasoline refiners
  - Must register each refinery
  - Must register by 12/1/2016, or 30 days prior to production of gasoline
- Gasoline importers
  - Must register each PADD in which they have an import facility
  - Must register by 12/1/2016, or 30 days prior to importation of gasoline
- Oxygenate blenders
  - Must register each oxygenate blending facility
  - Must register by 11/1/16, or 90 days prior to blending oxygenate into gasoline or BOB
- Pentane producers and importers (pentane used for pentane blending per 80.85)
  - Producers must register each pentane production facility, importers must register each PADD in which they have an import facility
  - Must register 30 days prior to production or importation of pentane



# Registered Parties Under Tier 3 (cont'd)

- Oxygenate producers
  - Must register each oxygenate production facility
  - Must register by 11/1/16, or 60 days prior to production of oxygenate
- Oxygenate importers
  - Must register each PADD in which they have an import facility
  - Must register by 11/1/16, or 60 days prior to importation of oxygenate
- Certified ethanol denaturant producers
  - Must register each ethanol denaturant production facility
  - Must register by 11/1/16, or 60 days prior to production of denaturant
- Certified ethanol denaturant importers
  - Must register each PADD in which they have an import facility
  - Must register by 11/1/16, or 60 days prior to importation of denaturant



# Registered Parties Under Tier 3 (cont'd)

- Parties which have already registered under a previous program (RFG, antidumping, RFS) do not need to re-register under Tier 3
- Gasoline refiners and importers do not need to re-register if previously registered under 80.76 or 80.103
- Oxygenate blenders do not need to re-register if previously registered under 80.76
  - Includes oxygenate blending facilities which blend oxygenate into both CG/CBOB and RBOB (already registered under RFG)
  - Previously registered oxygenate blending facilities must update their registration to specify type of oxygenate(s) blended
  - Refineries and import facilities which blend oxygenate into CG/CBOB must update their registration by adding “Oxygenate blender” as a business activity
- Oxygenate producers and importers do not need to re-register if previously registered under 80.1450
  - Previously registered oxygenate production facilities and oxygenate import facilities must update their registration by adding “Oxygenate producer” or “Oxygenate importer” as a business activity
- Links for registration
  - <https://www.epa.gov/fuels-registration-reporting-and-compliance-help>
  - <https://www.epa.gov/fuels-registration-reporting-and-compliance-help/user-guides-otaqdcfuel-central-data-exchange-cdx>



# Product Transfer Documents (80.1651, 80.1611)

- For transfers of gasoline, RBOB, CBOB, oxygenate, or certified ethanol denaturant, transferor must provide the following information to the transferee on the accompanying product transfer document (PTD)
  - Names/addresses of transferor and transferee
  - Volume of product transferred
  - Location of product transfer
  - Date of transfer
  - If applicable, language stating that the product qualifies for an exemption (national security, research, territories, export racing, California)
- PTDs for certified ethanol denaturant must also include specific regulatory language and state the sulfur content
- PTDs for oxygenates must also include the oxygenate name and the statement “maximum 10 ppm sulfur”
- PTDs for gasoline additives must state the maximum registered concentration and corresponding additive treatment rate



# Reporting (80.1652)

- Gasoline refiners and importers, and oxygenate producers and importers must submit annual reports containing the following information for each annual averaging period
  - Company and facility registration numbers
  - Total volume of gasoline or oxygenate produced or imported (by refinery, PADD or facility)
  - For each batch of gasoline or oxygenate, the batch number, volume, sulfur content, sulfur test method, and date of production
- Gasoline refiners and importers must also report the following additional information for each annual averaging period (by refinery or PADD)
  - Annual average gasoline sulfur content before and after inclusion of any gasoline sulfur credits
  - Number of credits owned at the beginning and end of each year
  - Number of credits generated, used, obtained, sold, or expired each year
- Refiners and importers must have their sulfur compliance calculations and credit activity independently verified in their attest engagements





# Recordkeeping (80.1653)

- Records must be kept for 5 years from date of creation
- Gasoline refiners and importers, oxygenate producers and importers, and certified denaturant producers must keep records of the information submitted in their reports and provided on their PTDs, plus the following additional information
  - For each batch sample collected, the location, date and time of the sample, and the name of the person who collected the sample
  - For each sample sulfur test result, the original printout from the sulfur analyzer, and the name of the person who conducted the test
- Gasoline refiners and importers must also keep records of their calculations showing compliance with the 10 ppm annual average sulfur standard, and information on sulfur credit activity (including calculations for sulfur credit generation, and commercial contracts for each credit transfer)
- Oxygenate producers and importers must also keep records on the data and calculations used to determine the sulfur content of each batch of oxygenate
- Additive manufacturers must keep records for each batch of additive produced, including the production date, volume, PTD, maximum treatment rate, and QC practices



# Performance Based Measurement System, aka PBMS (80.47)

- PBMS allows performance-based testing for all gasoline and diesel properties reported to EPA, including gasoline sulfur
- Initially used for measuring diesel sulfur content, Tier 3 expanded PBMS for use in measuring all gasoline complex model properties
- Establishes criteria for accuracy and precision in qualifying analytical test methods used in complying with EPA's gasoline and diesel programs
- Provides flexibility for a test facility to self-qualify a test method to specified accuracy and precision requirements, where each test facility's analytical instrument must also follow statistical quality control requirements to help ensure high quality test results



# For More Information...

- **Electronic Code of Federal Regulations, all subparts**

[http://www.ecfr.gov/cgi-bin/text-idx?SID=7d5978099b2c420d582bb63c5c15ff3a&mc=true&tpl=/ecfrbrowse/Title40/40cfr80\\_main\\_02.tpl](http://www.ecfr.gov/cgi-bin/text-idx?SID=7d5978099b2c420d582bb63c5c15ff3a&mc=true&tpl=/ecfrbrowse/Title40/40cfr80_main_02.tpl)

- **Electronic Code of Federal Regulations, Subpart O**

<http://www.ecfr.gov/cgi-bin/text-idx?SID=f29a487517aec5729c4efb9c07ed2362&mc=true&node=sp40.17.80.o&rgn=div6>

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