
Ultra-Low Sulphur Diesel (ULSD)

Customer/Associate Communication Kit

July 2006



Why change?

- New heavy-duty vehicles must meet new emission standards.
- New emission control systems (2007) to control particulate matter & nitrous oxide (NO_x) require ULSD
- Regulation for 100% of on-road fuel prevents misfueling.
- Integration in North American Vehicle Market
- Benefits for Environment: reduced particulates, less sulphur dioxide and NO_x

Regulatory Basis

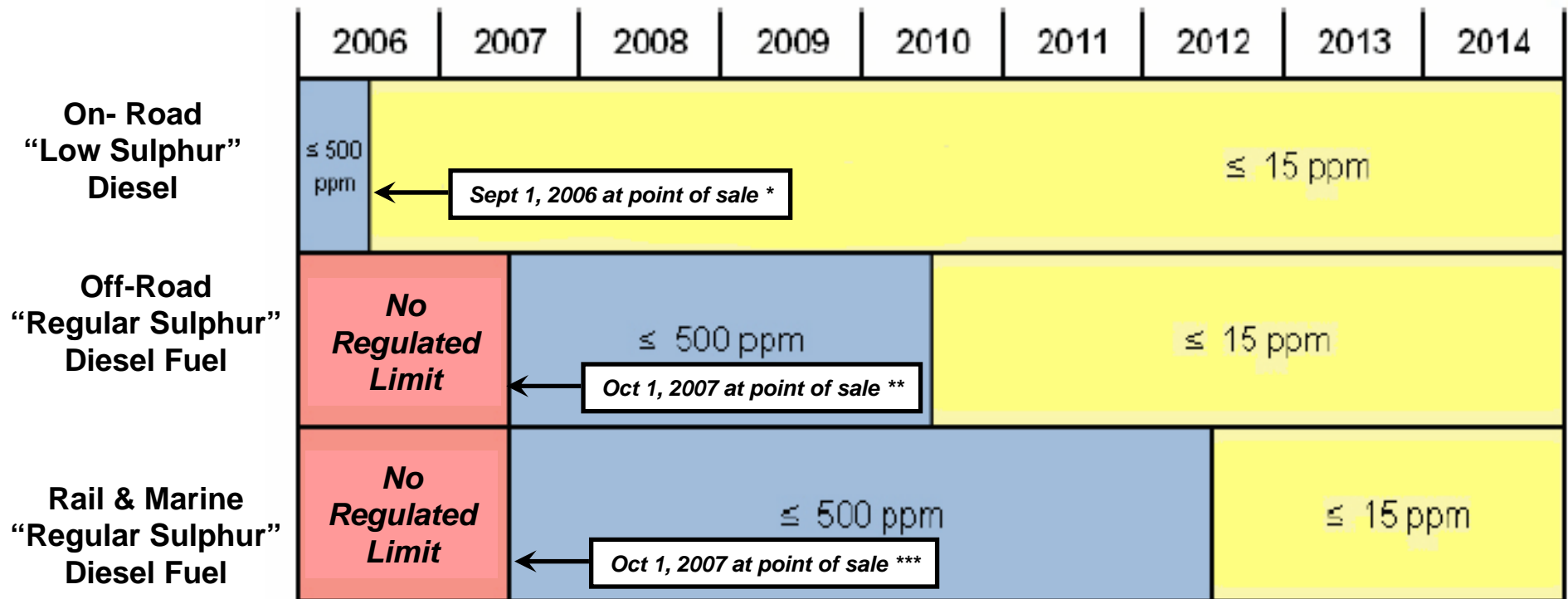
Federal regulations under Canadian Environmental Protection Act (CEPA) finalized for on-road LSD (currently 500 ppm sulphur):

by June 1, 2006 to 15 ppm max sulphur at refineries

by September 1, 2006 to 15 ppm max sulphur at point-of-sale



Regulatory Timeline



"Northern Supply Area" per Canadian General Standards Board

*** September 1, 2007**

**** December 1, 2008**

***** December 1, 2011**

This document was prepared for planning and discussion purposes only



Non-compliance could result in serious fines and penalties.

- For knowingly violating the regulations, fines up to a maximum of \$1 million and jail terms up to three (3) years.
- This would apply to any officer, director or agent of any corporation violating the regulations



Use of ULSD

- All on-road heavy duty diesel vehicles manufactured in model year 2007 will require ULSD.
- Some 2007 light duty vehicles will also require ULSD.
- Use of > than 15ppm sulphur will deactivate emission control devices in 2007 vehicles which require ULSD
 - The degree of deactivation or non-reversible damage will depend on the level of sulphur and the specific after-treatment technology used
- Use of ULSD in older vehicles not requiring it is not expected to cause operating issues
 - It may improve emissions and may be less corrosive to the engine.



How is ULSD different from existing product?

How does it differ from current low sulphur diesel?

- To make ULSD the refinery must treat it more severely
 - Molecules are broken apart to release sulphur

- This will likely change the properties of the diesel produced at most refineries.

- The properties affected can include: density, viscosity, lubricity, stability, low temperature operability and cetane number
 - Differences will depend on the refinery processes used to make ULSD.

- Additives will be used to maintain required performance characteristics
 - Specifically:
 - Lubricity and conductivity issues are understood and will be addressed in product formulation



Delivery system integrity

ULSD must meet the 15 ppm spec at point of sale

- Refineries producing ULSD below 15 ppm
- Terminal equipment and procedures are being upgraded to minimize sulphur pick-up
- Drain-dry or pump-dry facilities are being installed at some terminals
- Segregated delivery systems and updated change of service procedures will be required if ULSD and regular sulphur diesel or furnace fuel oil are delivered on the same truck
- Some truck configurations may require that they be dedicated to ULSD or excluded from ULSD service (e.g., shared manifolds)
- Refer to CPPI recommendations
 - See the CPPI web site
 - English <http://www.cppi.ca/tech/ULSD.pdf>
 - French http://www.cppi.ca/Technical_Documentsf.html

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- All Imperial Oil operated LSD tanks being converted now
 - To be complete by August 31
 - Timing of conversion to ULSD depends on the supply chain upstream of each inventory location
 - ***Resellers, dealers and customers responsible for own inventory conversion***

Inventory Conversion

- Key components of a site conversion plan should include:
 - Identify slow turnover sites/tanks; determine whether conversion will require special measures to ensure compliance by September 1
 - Regulations amended on June 23, 2006 to 22 ppm effective September 1, and 15 ppm effective October 15)
 - Keep inventories as low as possible throughout the conversion period
 - prior to each delivery, draw tank level down as low as possible; minimum volumes per operations manual preferred
 - Restrict volume delivered such that the ratio of volume delivered to tank heel is between 5:1 and 10:1
 - Monitor deliveries into each tank to ensure that a minimum of 3 deliveries of the required delivery ratio are completed
 - Engage the services of a product sampling and testing contractor to arrange testing to confirm sulphur level is less than 15.0 ppm
- We encourage you to consider incorporating the above into your conversion plans



Additional information

- CPPI http://www.cppei.ca/ULSD_Q_A_s.html
- Environment Canada CEPA Regulations
<http://www.ec.gc.ca/CEPARegistry/regulations/DetailReg.cfm?intReg=63&x=26&y=9>