

# Technical Support Document for Gasoline Dispensing Facilities General Order of Approval 003 Revision 1

**DRAFT February 11, 2021**



*Serving Island, Skagit & Whatcom Counties*

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## 1. SUMMARY

The General Order of Approval 003 (GO 003) was first issued on September 9, 2015. It provides for the simplified permitting of gasoline dispensing facilities (GDF) located in area sources. Under the terms of the General Order, a new GDF could be installed in counties under the jurisdiction of the Northwest Clean Air Agency (NWCAA) using this General Order.

In 2020, in accordance with our policy to periodically review the content of general orders, NWCAA reviewed the criteria for this General Order to determine whether changes were needed to the requirements reflecting any changes in regulations, ambient air quality standards, system designs, and available and installed emission controls.

As a result of that review, GO 003 Revision 1 has been issued, with the following changes from GO 003:

- Add a reference to NWCAA Section 580.6 – Gasoline Dispensing Facilities. This section of the NWCAA Regulation was amended and became effective on September 13, 2018, requiring uniform standards for most GDF within the jurisdiction of the NWCAA. The requirements of Section 580.6 supplement those in GO 003R1.
- Installation according to VR-103 has been removed from acceptable Stage I EVR equipment because it has not been renewed by the California Air Resources Board (CARB).
- GO 003R1 requires that all gasoline tank vent pipes at the GDF be equipped with properly functioning pressure vacuum vent caps. This aligns with the requirements in NWCAA regulation 580.6.
- GO 003R1 requires the pressure vacuum valve test to be done periodically, according to the station throughput. This test is required by 40 CFR 63 Subpart CCCCC, §63.11120(a)(1) for GDF with a monthly throughput greater than 100,000 gallons that do not have enhanced vapor recovery systems installed. CARB executive orders do not explicitly require this test, but leave it at the discretion of the permitting agency. Through GO 003R1, NWCAA is requiring that the test be done for GDF based on the following frequency:

GDF Throughput	Frequency
30,000 to 119,999 gal/yr	Every 5 calendar years
120,000 to 1,200,000 gal/yr	Every 3 calendar years
> 1,200,000 gal/yr	Every calendar year

- GO 003R1 requires that low permeation hoses be used at GDF.
- GO 003R1 corrects a discrepancy between the provisions in NWCAA 580.6 and GO 003 regarding the amount of time GDFs have to correct problems leading to vapor leaks.

It should be noted that systems permitted under GO 003 do not have to comply with the requirements of GO 003R1. GDFs which previously received coverage under GO 003 must continue to comply with the requirements of GO 003.

## 2. DESCRIPTION OF THE EMISSION SOURCE

Gasoline dispensing facility (GDF) means any stationary facility which dispenses gasoline into the fuel tank of a motor vehicle, motor vehicle engine, nonroad vehicle, or nonroad engine, including a nonroad vehicle or nonroad engine used solely for competition. This is the definition according to the federal rule for gas stations, 40 CFR 63 Subpart CCCCCC.

These facilities include, but are not limited to, facilities that dispense gasoline into on-road and off-road, street, or highway motor vehicles, lawn equipment, boats, test engines, landscaping equipment, generators, pumps, and other gasoline-fueled engines and equipment.

The pollutants emitted by each GDF are essentially the same. However, the operations that occur at each and the rates of emissions to the atmosphere differ. The emissions consist of a mixture of volatile organic compounds (VOC) vapors, some of which are also listed as air toxics under Washington State rules. The factors influencing emissions include gasoline composition, temperature, vapor pressure, and vapor recovery devices available at the GDF.

Gasoline used in motor vehicles is a complex organic mixture of varying amounts of paraffins, olefins, and aromatics. A study conducted for the EPA<sup>1</sup> reported liquid gasoline paraffin contents ranging from 37-67 weight percent, olefins ranging from 0-12 weight percent, and aromatics ranging from 28-52 percent. The average carbon number for gasoline generally falls in the C5-C7 range, but gasoline composition can vary widely.

Emissions of VOC at GDF occur due to evaporation, displacement of vapors during unloading of the fuel into onsite storage tanks (both above ground and underground), displacement of vapors during refueling of vehicles, breathing losses from the storage tanks, and emissions from accidental spillage of gasoline. On a lower scale, there are also emissions due to vapors permeating through the dispenser hose during refueling.

Emissions during unloading of gasoline into the gasoline storage tanks at the GDF are minimized by using submerged filling or bottom filling, in which the fill pipe opening is below the gasoline surface level in the tank. Emissions during unloading are also controlled with vapor balance. The vapors displaced from the receiving tank during unloading are routed back into the transport tanker and returned to the loading terminal. This typically involves having an extra tube connected to the receiving tank to transfer VOC-laden vapors displaced from the tank back into the tanker truck.

Evaporative emissions from vehicle refueling and diurnal breathing can be controlled with vapor recovery devices. Recovery of vapors displaced from the vehicle fuel tank during refueling can be accomplished with dispenser-based controls or vehicle-based onboard refueling vapor recovery (ORVR) systems.

Gasoline storage tank breathing loss emissions are controlled by vent pipe pressure/vacuum valves. Fuel spillage has been reduced by limits on pump dispensing rates and fuel spillage standards for vehicles. Fuel permeating through the dispenser hose during refueling is reduced by using specialized hoses with low permeation.

The annual throughput of gasoline at GDF varies considerably. According to 2018 data in the NWCAA jurisdiction, the average annual throughput was a little less than 1 million gallons, and the maximum was 17 million gallons.

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<sup>1</sup> Northeast Corridor Regional Modeling Project -Determination of Organic Species Profiles for Gasoline Liquids and Vapors. U.S. Environmental Protection Agency, Research Triangle Park, NC. Publication No. EPA-450/4-80-036a. December 1980.

### 3. METHODS OF CONTROL

Emissions from GDF are controlled either during refilling of the gasoline storage tanks by distribution vehicles or during actual refueling of vehicles.

#### 3.1 Stage I (or Phase I) control

Stage I controls refer to the system that is used to control the vapors emitted during refueling of the gasoline storage tanks. A schematic diagram is shown in Figure 3-1. A submerged fill pipe (also known as a drop tube) is permanently installed on the gasoline storage tank, and connected to the refueling truck. The fill pipe is required to extend to within six inches from the bottom of the tank (see discussion in Section 3.4). The truck also connects to a pipe to collect the vapors that are displaced from the gasoline filling the tank. The vapor collection pipe from the truck is connected to the top of the tank where displaced vapors are located. Stage I controls are required by this GO.

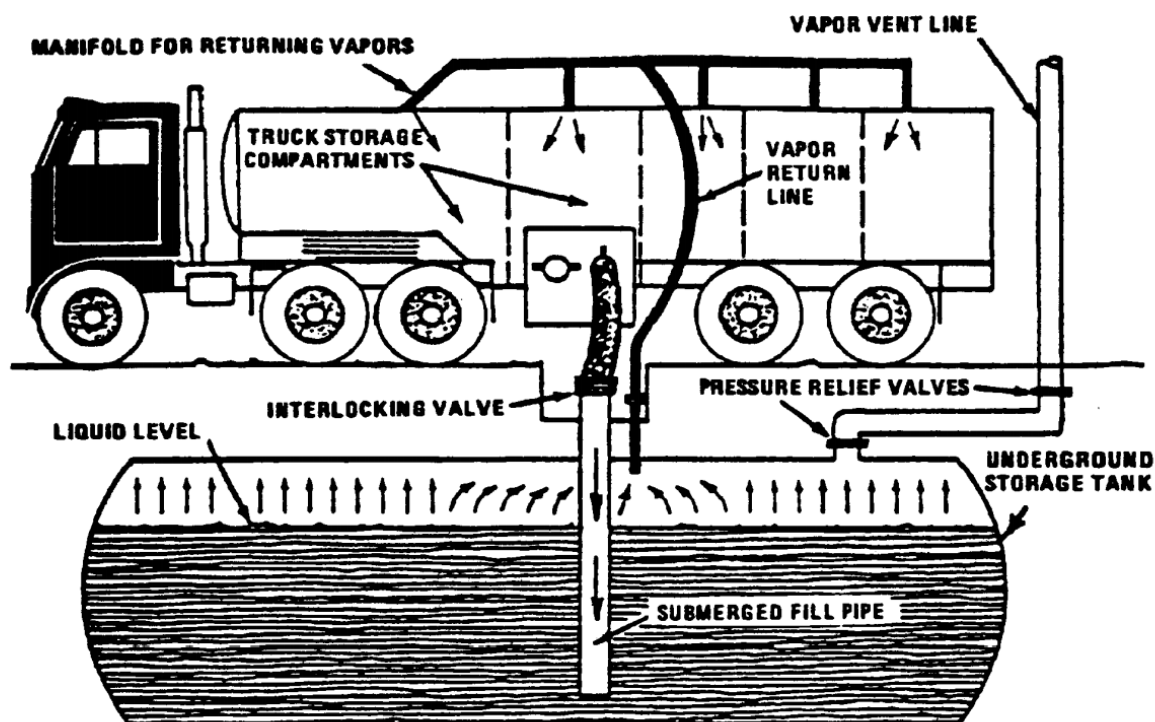


Figure 3-1 Refilling of gasoline storage tanks<sup>2)</sup>

#### 3.2 Stage II (or Phase II) control

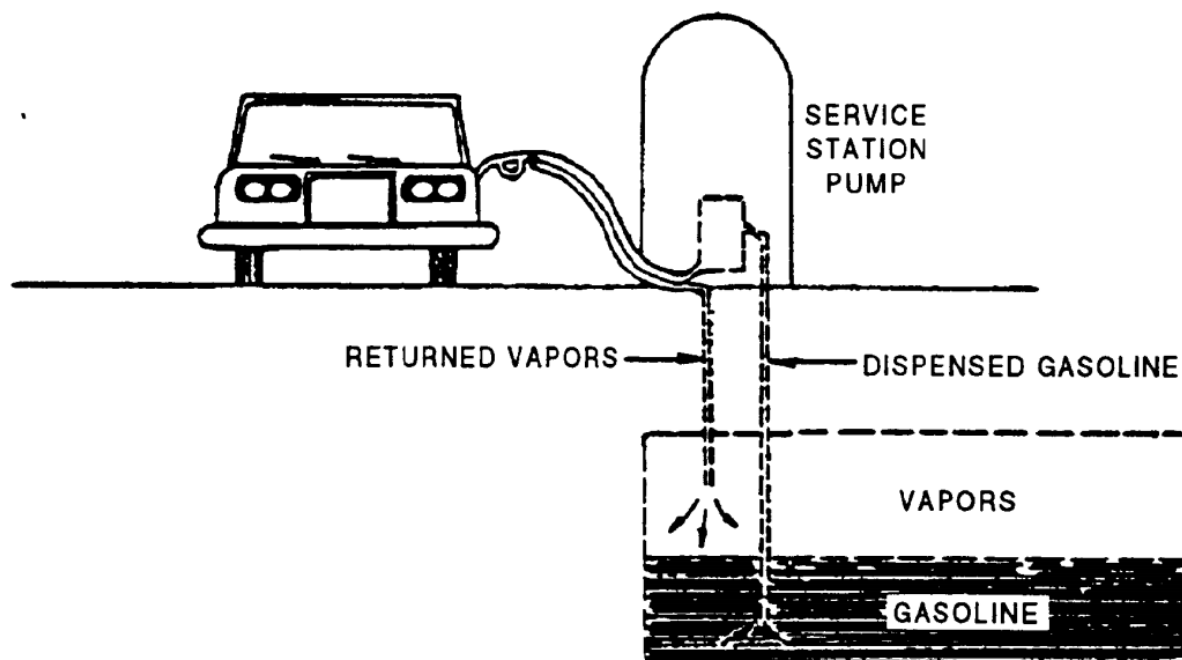
Stage II controls refer to controlling of the gasoline vapors emitted during vehicle refueling. Stage II vapor recovery during vehicle refueling is an effective control technology to reduce gasoline vapor emissions that contain volatile organic compounds (VOC) and hazardous air pollutants. The Clean Air Act Amendments (CAAA) of 1990 required the installation of Stage II vapor recovery systems in many ozone nonattainment areas.

NWCAA's jurisdiction is in attainment (meeting) the federally mandated ozone standard. As discussed in Section 3.3, such areas are eligible to allow gas stations to operate without Stage II controls if a large portion of the vehicles being refueled are equipped with onboard

<sup>2</sup> <http://www.epa.gov/ttn/chief/ap42/ch05/final/c05s02.pdf>, accessed on 8/10/2020)

refueling vapor recovery (ORVR). ORVR is a different method of controlling the same vapors as Stage II controls. Because a large portion of vehicles in NWCAA's area are equipped with ORVR, this GO does not require Stage II.

Section 4.2.1 discusses a sub-set of GDFs that, due to close proximity to permanent residences, must be equipped with Stage II controls regardless of ORVR fleet penetration. This GO does not apply to this small subset of GDFs. Such GDFs are instead required to obtain an Order of Approval to construct in accordance with NWCAA 300.1.



**Figure 3-2 Car refueling vapor recovery system (taken from Chapter 5 of AP-42<sup>3</sup>)**

### 3.3 ORVR and the phasing out of Stage II

Onboard Refueling Vapor Recovery (ORVR) is a vehicle emission control system that captures fuel vapors from the vehicle gas tank during refueling. The gas tank and fill pipe are designed so that when refueling the vehicle, gasoline vapors in the gas tank travel to a canister packed with activated carbon, which adsorbs the gasoline vapors. When the engine is in operation, it draws the gasoline vapors into the engine intake manifold to be used as fuel.

During the phase-in of ORVR controls, which began in 1997, Stage II vapor recovery was used to provide control of VOC from GDF during refueling of vehicles. However, Stage II systems had to be carefully designed and operated to ensure they weren't competing with ORVR systems. Studies show that such competition can increase the amount of vapors emitted during refueling.

Congress recognized that ORVR and Stage II would eventually become largely redundant technologies, and provided authority to the EPA to allow states to remove Stage II from their SIP after EPA finds that ORVR is in widespread use.

Effective May 16, 2012, the date the final rule was published in the Federal Register (77 FR 28772), the EPA determined that ORVR is in widespread nationwide use for control of

<sup>3</sup> <http://www.epa.gov/ttn/chief/ap42/ch05/final/c05s02.pdf>, accessed on 8/10/2020

gasoline vapor emissions during refueling of vehicles at GDF. EPA's study estimates that by 2020, more than 90 percent of gasoline refueling nationwide will occur with ORVR-equipped vehicles. Stage II programs have become largely redundant control systems.<sup>4</sup>

The NWCAA, in accordance with the state rule pertaining to GDF, WAC 173-491, no longer requires Stage II controls except for a limited subset of larger GDFs located close to permanent residences. See Section 4.2.1 for further discussion.

### **3.4 Other losses**

Emissions from GDF also occur by mechanisms other than those described above (fueling cars and re-filling of the storage tanks).

Emissions are generated when gasoline vapors are displaced to the atmosphere during the day-to-day operation of a GDF. During periods when there is either no dispensing or when there is a significant slowdown in the dispensing of fuel to vehicles, such as overnight periods, gasoline in a storage tank evaporates into the headspace above the liquid fuel. The vapor growth caused by this evaporation increases the storage tank static pressure. If the static pressure exceeds the pressure allowed by the tank's safety relief valve, the valve opens and releases vapors. Pressure driven emissions could be controlled by a processing unit that includes either a bladder tank, membrane separator, carbon canister or thermal oxidizer. However, such controls have not been found to be cost effective by NWCAA, so they are not required in this GO.

In addition, emissions are generated from dispensing nozzle spillage of liquid gasoline during the act of vehicle fueling, including pre-fueling, fueling and post-fueling spillage.

Emissions are also caused by the migration of liquid gasoline through the outer dispenser hose material and to the atmosphere through permeation.

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<sup>4</sup> <https://nepis.epa.gov/Exe/ZyPURL.cgi?Dockey=P100F2E3.TXT>, accessed on 12/16/2020.

#### 4. APPLICABLE EMISSION CONTROL REGULATIONS

##### 4.1 Federal Rule

GDF are subject to an area-source NESHAP, 40 CFR 63 Subpart CCCCCC: National Emission Standards for Hazardous Air Pollutants for Source Category: Gasoline Dispensing Facilities.

The definition of a GDF in Subpart CCCCCC is as follows:

*Gasoline dispensing facility (GDF) means any stationary facility which dispenses gasoline into the fuel tank of a motor vehicle, motor vehicle engine, nonroad vehicle, or nonroad engine, including a nonroad vehicle or nonroad engine used solely for competition. These facilities include, but are not limited to, facilities that dispense gasoline into on- and off-road, street, or highway motor vehicles, lawn equipment, boats, test engines, landscaping equipment, generators, pumps, and other gasoline-fueled engines and equipment.*

It should be noted that there is no minimum throughput below which the provisions of Subpart CCCCCC do not apply.

The requirements of 40 CFR Part 63 Subpart CCCCCC are summarized in Table 4-1.

**Table 4-1 National Air Toxic Standards for Gasoline Dispensing Facilities<sup>2</sup>**

<b>Monthly Throughput</b>	<b>Requirements</b> (Must be in compliance by 1/10/2011 for existing GDF, and upon startup <sup>5</sup> for new GDF)	<b>Reporting</b>
< 10,000 gallons	<ol style="list-style-type: none"> <li>1. Minimize spills.</li> <li>2. Clean up spills expeditiously.</li> <li>3. Cover gasoline containers &amp; storage tank fill pipes with gasketed seal.</li> <li>4. Minimize gasoline sent to open collection systems.</li> </ol>	None, however must be able to demonstrate, within 24 hours of request, throughput is below 10,000 gallons per month.
≥ 10,000 gallons but <100,000 gallons	<p><b>All of the above, plus:</b></p> <ol style="list-style-type: none"> <li>5. For storage tanks ≥ 250 gallons capacity, load storage tank using submerged fill with discharge that is no more than the following from the bottom of tank:               <ol style="list-style-type: none"> <li>a) 12 inches for pipes installed on or before 11/9/2006</li> <li>b) 6 inches for pipes installed after 11/9/2006.</li> </ol> </li> </ol>	<ol style="list-style-type: none"> <li>1. Initial Notification by 5/9/08 for existing GDF, and within 15 days for new or reconstructed GDF<sup>6</sup></li> <li>2. Compliance status by 1/10/11.</li> </ol>
>100,000 gallons	<b>All of the above, plus <u>ONE</u> of the below:</b>	Same as 1 & 2 above, plus:

<sup>5</sup> New and reconstructed GDF constructed after 11/9/2006 must be in compliance upon startup or 1/10/2008, whichever is later.

<sup>6</sup> In some cases, Initial Notification and Notification of Compliance Status are not required if submerged fill and/or vapor balance system was installed prior to 1/10/08 and meets certain prior enforceable conditions (see 40 CFR 63.11124(a)(3) and (b)(3)).



<b>Monthly Throughput</b>	<b>Requirements</b> (Must be in compliance by 1/10/2011 for existing GDF, and upon startup <sup>5</sup> for new GDF)	<b>Reporting</b>
	<p>6. Operate a vapor balance system installed prior to 1/10/08, that meets an enforceable State, local, or tribal rule or permit that requires, either</p> <ul style="list-style-type: none"> <li>a) Achieves an emission reduction of at least 90%, <b>OR</b></li> <li>b) Operates meeting the management practices specified below under 7.</li> </ul> <p>7. Operate vapor balance system during storage tank loadings using the following management practices.</p> <ul style="list-style-type: none"> <li>i) Equip connections &amp; lines with seal closures</li> <li>ii) Vapor tight line from storage tank to cargo tank</li> <li>iii) Cargo Tank pressure remains below specified settings</li> <li>iv) Designed to prevent over tight/loose fittings</li> <li>v) Gauge well provided with submerged drop tube extending specified distance (see item 5) from tank bottom</li> <li>vi) Use vapor tight caps for liquid fill connections</li> <li>vii) Install pressure/vacuum vent valves on tank vent pipes at specified setting, and test initially and every 3 years</li> <li>viii) Vapor balance system must meet static pressure test initially and every 3 years</li> <li>ix) Dual-point (no coaxial) vapor balance systems for new GDF or tanks, and reconstructed GDF.</li> </ul> <p>8. Vapor balance system demonstrated to achieve a reduction of 95% or better.</p>	<p>3. Keep records, report, and test as specified in enforceable conditions.</p> <p>For requirements 7 &amp; 8, same as 1 &amp; 2 above, plus:</p> <p>4. Keep record of initial and triennial pressure tests.</p> <p>5. Test notification 60 days before test and test results 180 days after testing.</p>

## 4.2 State Regulations

### 4.2.1 Chapter 173-491 WAC

Chapter 173-491 WAC has provisions for the control of air contaminants emitted from gasoline marketing sources. This chapter is more general in scope than the federal rule described in Section 4.1 and the NWCAA Regulation described in Section 4.3, and applies to gasoline marketing operations, including the storage, transport, and transfer of gasoline, the transfer of gasoline from storage tanks into transport tanks, and from storage tanks into motor vehicles. In addition, Chapter 173-491 WAC has different provisions for ozone attainment and non-attainment areas. Section 4.2.1 only describes what applies to GDF in the NWCAA jurisdiction, which is in ozone attainment.

WAC 173-491-040(4) contains the provisions for gasoline dispensing facilities (Stage I) that apply to the delivery of gasoline to gasoline dispensing facilities located in ozone attainment areas with an annual gasoline throughput greater than 360,000 gallons and all new gasoline

dispensing facilities with a total gasoline nominal storage capacity greater than 10,000 gallons. It requires that all gasoline storage tanks of the facilities be equipped with submerged or bottom fill lines and fittings to vapor balance gasoline vapors with the delivery transport tank and allows gasoline storage tanks with offset fill lines to be exempt if installed prior to January 1, 1979.

Also, WAC 173-491-040(4) requires the owner or operator of a GDF to attach the vapor balance system to the transport tank and to be operated satisfactorily during the loading of gasoline into storage tanks.

WAC 173-491-040(5)(c) requires new and modified GDFs with an annual gasoline throughput of 1.5 million gallons or more to be equipped with Stage II if a permanent residence is located within the distance and throughput specifications of Table 4-2 (below). This requirement trumps the allowance discussed in Section 3.2 to remove Stage II from GDFs in NWCAA's area. If a GDF is built within the distance and throughput specifications in Table 4-2, Stage II **is** required. Such GDFs are not eligible for this GO. Instead, they must obtain an Order of Approval to Construct in accordance with NWCAA 300.1.

**Table 4-2 Throughput vs distance requirements for Stage II controls**

Gasoline Throughput (millions of gallons)	Allowable Distance to the Property Line (meters)
1.5	20
2.0	25
4.0	38
6.0	49
8.0	58
10.0	66

When the throughput is not shown in Table 4-2, WAC 173-491-040(5) states that one must interpolate to get the distance for that throughput. The allowable distance is to be measured from the centroid of the pumps to the nearest point on the property line of the nearest lot on which a permanent residence is located. However, if the permanent residence is located at least twice the allowable distance from the centroid of the pumps, then Stage II controls are not required.

#### **4.2.2 Chapter 173-460 and 173-400-110 WAC**

Chapter 173-460 WAC requires review of toxic air pollutant (TAP) emission increases from new or modified sources as part of New Source Review (NSR) permitting for sources that require NSR permits under WAC 173-400-110. Some of the pollutants emitted by GDF, such as benzene, are TAPs.

According to WAC 173-400-110(4)(xl) (effective 12/29/12) GDF subject to chapter 173-491 WAC are exempt from TAP analysis pursuant to chapter 173-460 WAC.

The NWCAA has its own NSR rules but in this case they mirror WAC 173-400-110(4)(xl). According to NWCAA 300.3(J)(31) (passed 4/11/19), GDF subject to chapter 173-491 WAC are exempt from TAP analysis pursuant to chapter 173-460 WAC.

#### **4.3 NWCAA Regulation (Section 580.6)**

The NWCAA Regulation applies to GDFs with an annual throughput of 200,000 gallons or more and to GDFs constructed or reconstructed after January 1, 1990 with a nominal total gasoline storage capacity greater than 10,000 gallons.

In accordance with 580.63, all tanks with a capacity less than 2,000 gallons installed before January 1, 1990, all tanks with offset fill lines installed before January 1, 1990 and all tanks with a capacity less than 260 gallons are exempt from the requirements in the NWCAA Regulation.

NWCAA requires gasoline storage tanks to be equipped with a permanent submerged fill pipe and approved vapor recovery system, and maintained in a vapor-tight condition. In addition, all vapor return lines must be connected between the transport tank and the stationary storage tank and the vapor recovery system must be operating.

Moreover, the transfer of gasoline from a stationary tank into a motor vehicle fuel tank must be in accordance with the provisions of WAC 173-491.

## 5. BACT

State law and local rules<sup>7</sup> define BACT as “an emission limitation based on the maximum degree of reduction for each air pollutant subject to regulation under the Washington Clean Air Act emitted from or which results from any new or modified stationary source, which the permitting authority, on a case-by-case basis, taking into account energy, environmental and economic impacts and other costs, determines is achievable for such source or modification through application of production processes and available methods, systems, and techniques, including fuel cleaning, clean fuels, or treatment or innovative fuel combustion techniques for control of each pollutant.” BACT is required during the NSR permit review process.

NWCAA requires a permit applicant to use a “top-down” process to determine BACT as part of the NSR application. This GO is a type of NSR permit, so a BACT analysis is required. For this GO, NWCAA performed all of the top-down analysis that’s traditionally performed by the applicant and documented the review in this document.

In the “top-down” analysis process, the applicant lists and ranks all potential pollutant control options from highest level of control (lowest emission rate) to the lowest (highest emission rate). Next, those emission control options that are technically infeasible are removed from the list of available controls. If a particular emission control has been installed and is operating at an identical or similar facility, it is considered to be an available control. The highest level of control remaining is considered technically feasible to implement on the emission unit. An applicant may choose to demonstrate that the highest level of emissions control is not financially feasible (not cost-effective) to implement or has adverse environmental or energy impacts. In this case, the applicant evaluates the economic, environmental, and energy impacts of the next most stringent level of control until a level of control is demonstrated to be economically feasible.

In the case of a GDF, emissions are in the form of gasoline vapors, which is the product GDF are selling. In general, control of gasoline vapors falls into two classes: (a) detecting, and reducing the emissions in the first place, and (b) capturing emissions and returning them to the tank.

When evaluating BACT, NWCAA also looks to other regulations issued across the country as well as federal regulations issued by EPA. EPA, when developing Subpart CCCCCC to Part 63 of 40 CFR, used GACT (generally available control technologies), instead of MACT (maximum achievable control technologies), as allowed by the Clean Air Act in Section 112(d)(5). EPA’s primary focus when developing this area source NESHAP was to fulfill their obligations under CAA section 112(c)(3) for regulating stationary sources of benzene. Of course, Subpart CCCCCC will achieve reductions in both HAP and VOC emissions, however EPA focused on the HAP cost-effectiveness values in determining what GACT is for facilities in this area source category<sup>8</sup>. NWCAA can and does go beyond the requirements of GACT in its NSR review process when it evaluates BACT.

Traditionally, NWCAA has relied on California Air Resources Board (CARB) executive orders (EO) as a convenient way to define what equipment configurations, or systems, applicants can install that work together and meet BACT for GDF. Manufacturers of vapor recovery systems submit their systems to the CARB who then evaluate and test these systems to make sure they meet the stringent certification requirements for the state of California.

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<sup>7</sup> RCW 70.94.030(7), WAC 173-400-030(12), and Section 200 of the NWCAA Regulation.

<sup>8</sup> See discussion in Federal Register Vol. 73, No. 7 (January 10, 2008)

When a vapor recovery system is approved by the CARB, an EO is issued that describes in detail the equipment that has been approved, and the installation and testing requirements that are needed to ensure that the system operates as designed.

Current CARB executive orders cover what is known as enhanced vapor recovery (EVR) systems, which must be at least 98% efficient as tested in accordance with test procedure TP-201.1, Volumetric Efficiency for Phase I Systems, of the CARB. This efficiency is better than the 95% efficiency required by Subpart CCCCCC of 40 CFR 63 (see 40 CFR 63.11120(b)(1)).

Based on the discussion above, for new or reconstructed GDF, BACT will be the installation equipment compatible with Stage I EVR CARB Executive Orders. This is the same requirement as was part of the original GO 003 issued in 2015.

Stage II is not required for GDFs that qualify for this GO. See Section 4.2.1 for further discussion. Note that a small subset of GDFs in NWCAA's jurisdiction are still required to install Stage II. This GO does not apply to GDFs that are required to have Stage II controls.

**Low permeation hoses (new in Revision 1):** GO 003 Revision 1 requires that hoses installed at qualifying GDF be equipped with low permeation hoses. According to information from CARB<sup>9</sup>, a hose that is low-permeation provides, on average, a 96% reduction of VOC over conventional hoses. Emissions from low permeation hoses are 0.062 lb of VOC per 1,000 gallons (see next section on Emissions). Thus, emissions from conventional hoses may be taken to be 1.55 lb of VOC per 1,000 gallons<sup>10</sup>.

The average throughput of a gas station in the NWCAA jurisdiction is 1 million gallons (see next section on Emissions). The VOC saved from using low-permeation hoses would be  $(1.55 - 0.062) \times 1,000,000 / 1,000 = 1,488$  lb VOC per year.

Low permeation hoses need to be replaced every two years, as is the case for conventional hoses, and cost approximately \$10 per hose more than conventional hoses. Assuming that there are 12 hoses in each GDF, the extra cost to use low permeation hoses over conventional hoses would be \$120 for two years. This would result in a savings of emissions of  $1,488 \times 2 / 2000 = 1.488$  tons of VOC, for a cost of about \$80 per ton of VOC saved.

This cost is sufficiently low for NWCAA to consider low permeation hoses to be BACT for new GDFs and require them in GO 003 Revision 1. It is also worth noting that some existing gas stations in NWCAA's jurisdiction have already taken the initiative and are using low permeation hoses. In fact, NWCAA learned about these hoses during routine GDF inspections. The fact that such hoses are already in use by some GDFs further supports the conclusion that use of low permeation hoses on new GDFs that apply for coverage under GO 003 Revision 1 is BACT.

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<sup>9</sup> <https://ww3.arb.ca.gov/regact/2011/evr11/gdfhapp4.pdf>, accessed on 12/7/2020

<sup>10</sup> In the original issuance of this general order, GO 003, the emission factor for low permeation hoses was used in calculating emissions, but GO 003 didn't require low permeation hoses. GO 003R1 corrects this by both requiring low permeation hoses and using the emission factor for such hoses.

## 6. ESTIMATION OF EMISSIONS

Emission factors from GDF are based on testing done by the CARB and are presented in Table 6-1.

**Table 6-1 Vehicle Fueling Emission Factors<sup>11</sup>**

Sub Category	Uncontrolled	Pre-EVR	EVR
Emission factor (lb of total organic carbon per 1000 gallons)			
<b>Stage II Fueling</b>			
Non-ORVR vehicles	8.4	2.4	0.42
ORVR vehicles	0.42	0.12	0.021
<b>Stage I Bulk Transfer</b>	7.7	0.38	0.15
<b>Pressure driven losses</b>	0.76	0.092	0.024
<b>Stage II fueling – spillage</b>	0.61	0.42	0.24
<b>Hose permeation</b>	0.062	0.062	0.062

Emissions from gas stations depend on their throughput. According to 2018 throughput data reported by GDF in the NWCAA jurisdiction, the highest annual throughput reported by a single facility was approximately 17 million gallons, and the average value for all gas stations was about 1 million gallons. Total throughput of gasoline in the NWCAA jurisdiction during 2018 was about 201 million gallons.

A new facility would have to install EVR Stage I (see discussion for BACT in Section 5), but be uncontrolled for Stage II (no Stage II is required). For cars that are equipped with ORVR, the total emission factor would be the sum of the following (see Table 6-1): 0.42 lb/1000 gal (uncontrolled fueling), 0.15 lb/1000 gal (EVR Stage I bulk transfer losses), 0.024 lb/1000 gal (EVR pressure driven losses), 0.61 lb/1000 gal (non-Stage II spillage), and 0.062 lb/1000 gal (hose permeation), for a total of 1.27 lb of total organic gas per 1000 gallons.

The emission factor from GDF refueling non-ORVR equipped vehicles, using data from Table 6-1 is: 8.4 lb/1000 gal (uncontrolled fueling, i.e. no Stage II), 0.15 lb/1000 gal (EVR Stage I bulk transfer losses), 0.024 lb/1000 gal (EVR pressure driven losses), 0.61 lb/1000 gal (non-Stage II spillage), and 0.062 lb/1000 gal (hose permeation), for a total of 9.25 lb of total organic gas per 1000 gallons.

EPA estimated that in 2014 the fraction of vehicles equipped with ORVR technology was about 82%<sup>12</sup>. EPA's estimate for 2020 (the year of this GO revision) is 92%. ORVR is expected to be present on 96% of vehicles by 2025.

<sup>11</sup> Table adapted from <https://ww2.arb.ca.gov/gasoline-dispensing-facility-emission-factors> accessed on 8/10/2020.

<sup>12</sup> Glenn Passavant, OTAQ, Memorandum to Public Docket EPA-HQ-OAR-2010-1076, Updated Data for ORVR Widespread Use Assessment, 2012.

Assuming that 92% of vehicles are equipped with ORVR, for a GDF that has an annual throughput of 1 million gallons per year (the NWCAA average, 2018 data), emissions of total organic carbon compounds would be  $(0.92 \times 1.27 + 0.08 \times 9.25) \times 1000 / 2000 = 0.95$  tons per year. Similarly, emissions from a GDF with a throughput of 17 million gallons (the NWCAA maximum, 2018 data), would be 16.2 tons per year.

## 7. PUBLIC INVOLVEMENT

Public involvement for this General Order has been ensured via compliance with relevant portions of the Washington Administrative Code and the Regulation of the NWCAA.

NWCAA has its own public involvement provisions under NWCAA Section 305. Specifically, NWCAA 305.2(A)(9) requires the agency to *provide public notice and a public comment period* before approving or revising a General Order of Approval issued under NWCAA 300.16.

NWCAA requirements are

- Publication of a notice on the NWCAA website for at least 30 days
- Publication of the technical support document, and the General Order on the NWCAA webpage for at least 30 days
- Notice to the US Environmental Protection Agency Region 10 Regional Administrator

The NWCAA has met the public notice requirements by taking the following action.

- A public notice of the agency's preliminary determination to issue the GO was posted to the NWCAA website on February 11, 2021 of a period of no less than 30 days ending on March 12, 2021. This posting included the public notice (Attachment 2), August 30 General Order 003R1 and associated Technical Support Document.
- The US EPA Region 10 Administrator was send a copy of the public notice on February 11, 2021.
- A copy of the docket containing the public notice, General Order 003R1 and associated Technical Support Document maintained at the NWCAA office.

A public hearing will be scheduled if a public hearing will be requested during the public comment period.



## **8. NWCAA REGISTRATION**

The source registration program under Section 320 of the NWCAA Regulation requires non-Title V sources to register with the agency and pay annual registration fees. Issuance of this General Order will not change registration requirements with the NWCAA.

According to NWCAA 320.5(A) any source that has been confirmed to be covered by a General Order of Approval by NWCAA needs to be registered. Also, according to NWCAA 320.5 (B) gasoline dispensing facilities need to be register with the NWCAA.

## **9. STATE ENVIRONMENTAL POLICY ACT (SEPA)**

Issuance of this General Order of Approval for GDF is considered a project approval action under the requirements of Section 155 of the NWCAA Regulation - State Environmental Policy Act (SEPA).

A new SEPA determination is not required because this is a permit revision that will not result in an increase in pollutant emissions, or affect other environmental factors. The original project (GO 003) was reviewed under SEPA and a DNS was issued by NWCAA on April 21, 2015. A copy of this DNS is included in the project documents folder and is being relied upon for this project.

Accordingly, the following exemption is being exercised: *NWCAA 155.2(A) which references WAC 197-11-600: When to use existing environmental documents.*

This SEPA determination is for air emissions from GDF under coverage by the General Order. This NWCAA SEPA determination does not include construction of a building or any other facility related to the GDF. Construction of the building or other related facilities may be evaluated under SEPA by the city or county officials with jurisdiction as an independent SEPA action.

## **10. COMPLIANCE WITH NWCAA 300.16 CRITERIA**

This GO is issued pursuant to NWCAA 300.16. NWCAA 300.16(A)(1)(a) through (f) lists specific criteria that must be met, as appropriate, in issuing the GO. Each criterion and how it is addressed by GO 003R1 is described below..

### **10.1 NWCAA 300.16(A)(1)(a): Emissions limitations and/or control requirements based on Best Available Control Technology (BACT) and/or BACT for Toxic Air Pollutants (T-BACT)**

Best available control technology for GDF is installation, operation, maintenance, and testing of stage I EVR compatible equipment in accordance to CARB executive orders. See Section 5 of this document for more discussion. GDF are exempt from toxic air pollutant analysis pursuant to chapter 173-460 WAC according to NWCAA 300.3(J)(31), and therefore not subject to T-BACT.

### **10.2 NWCAA 300.16(A)(1)(b): Operational restrictions, such as (i) Criteria related to the physical size of the source or emissions unit(s) covered; (ii) Criteria related to raw materials and fuels used; (iii) Criteria related to allowed or prohibited locations; and (iv) Other similar criteria as determined by the NWCAA**

Location of a GDF needs to be examined to ensure that provisions in WAC 173-491-040(5) are not violated. These provisions govern the installation of Stage II controls when the annual throughput of gasoline in relation to the distance of the gasoline pumps from nearby residences is less than what is allowed.

GO 003R1 does not apply to facilities that install Stage II controls (see discussion in Section 4.2).

### **10.3 NWCAA 300.16(A)(1)(c): Monitoring, reporting and recordkeeping requirements to ensure compliance with the applicable emission limits and/or control requirements**

GO 003R1 requires the owner/operator to notify the NWCAA when the GDF begins operations. The owner/operator also must notify the NWCAA within 24 hours of any failed compliance tests, if the problems cannot be rectified on the day of the test.

### **10.4 NWCAA 300.16(A)(1)(d): Initial and periodic emission testing requirements**

GO 003R1 contains requirements for testing of the Stage I system, both initially and every three years.

### **10.5 NWCAA 300.16(A)(1)(e): Compliance with WAC 173-400-112, NWCAA 300.9(B), and NWCAA 300.9(C), as applicable**

WAC 173-400-112 does not apply in areas that are in attainment with the National Ambient Air Quality Standards (NAAQS). The majority of NWCAA's jurisdiction, with the exception of a small area around the Intalco Aluminum Smelter in the Cherry Point Heavy Industrial Area, is in attainment (meeting) all NAAQS. The requirements of WAC 173-400-112 don't apply in attainment areas.

EPA is in the process of designating a small area of NWCAA's jurisdiction around the Intalco Aluminum Smelter as out of attainment (not meeting) the sulfur dioxide (SO<sub>2</sub>) NAAQS. The nonattainment area will be quite small and the majority of the area is owned/occupied by the Intalco and Petrogas facilities. There are no GDFs inside the expected nonattainment

area, and we don't expect any to be installed. Even if GDFs were installed, GDFs don't emit SO<sub>2</sub>. So, the permitting requirements of WAC 173-400-112 won't be triggered.

NWCAA 300.9(B) requires the following:

1. Comply with all applicable New Source Performance Standards (NSPS), National Emission Standards for Hazardous Air Pollutants (NESHAP), National Emission Standards for Hazardous Air Pollutants for source categories (NESHAP), emission standards adopted under chapter 70.94 RCW and all applicable NWCAA emission standards.

The only federal rule that applies to GDF is 40 CFR 63 Subpart CCCCCC - National Emission Standards for Hazardous Air Pollutants for Source Category: Gasoline Dispensing Facilities. This GO has more stringent requirements than the federal rule, as discussed in more detail in Section 4.1.

2. Employ Best Available Control Technology

See Section 10.1.

3. Allowable emissions will not cause or contribute to a violation of any ambient air quality standard. In addition, if located in a nonattainment area, allowable emissions will not violate the requirements for reasonable further progress established by the State Implementation Plan (SIP). If NWCAA has reason to be concerned that the construction or modification would cause or contribute to a violation of a NAAQS, NWCAA may require modeling using the guideline models and procedures of Appendix W of 40 CFR Part 51 as referenced in NWCAA 104.2. Written approval from the EPA must be obtained for any modification to or substitution for a guideline model.

NWCAA's entire 3 county jurisdiction is currently in attainment (meeting) the ozone NAAQS. Ozone is the NAAQS of highest concern when it comes to GDFs as GDFs release gasoline vapors that contribute to ozone formation. NWCAA's monitoring leads us to believe that all 3 counties will continue to be in attainment with the ozone NAAQS.

As noted earlier, there is one small area in NWCAA's jurisdiction that we expect to be re-classified as nonattainment (not meeting) a NAAQS in the near future. That area is a small section of land surrounding the Intalco Aluminum Smelter in the Cherry Point Heavy Industrial Area. EPA is about to re-designate the area as nonattainment (not meeting) the SO<sub>2</sub> NAAQS. There are currently no GDFs in the area and given the area's size and location, we don't expect any GDFs will locate there. Even if they did, GDFs don't emit SO<sub>2</sub>, the nonattainment pollutant. So, GDFs won't cause or contribute to violations of the NAAQS. Given these factors, EPA's expected designation of the area as nonattainment with the SO<sub>2</sub> NAAQS will have no affect on this GO.

4. Comply with the applicable requirements of NWCAA Section 305.

See Section 7.

5. Comply with the applicable requirements of WAC 173-400-200 and 173-400-205. WAC 173-400-200 titled "Creditable stack height and dispersion techniques", prohibits the use of dispersion techniques or excess stack height to meet ambient air quality standards or PSD increment limitations.

WAC 173-400-205 titled "Adjustment for atmospheric conditions" prohibits varying emissions according to atmospheric conditions or ambient concentrations of that pollutant, except as directed during an air pollution episode.

None of these are applicable to GDF emissions. Also see item 3 above.

6. All fees required under NWCAA 324.2 have been paid.

The application for coverage under this GO includes the fees required.

NWCAA 300.9(C) requires a toxic air pollutant review be performed under Chapter 173-460 WAC as referenced under WAC 173-400-110(2)(d).

GDF are exempt from TAP analysis under WAC 173-460. See Section 4.2.2

**10.6 NWCAA 300.16(A)(1)(f): Compliance with 40 CFR Parts 60, 61, 62, and 63; emission standards adopted under chapter 70.94 RCW; and all applicable NWCAA emission standards**

Compliance with federal, state, and NWCAA air quality rules is required under NWCAA 300.9(B) as well. See discussion in Section 10.5.

**10.7 NWCAA 300.16(A)(1)(g): The application and approval process to obtain coverage under the specific General Order of Approval**

The application and approval process to obtain coverage under this GO are included in the first page of the GO. The application form is the same as the one that has been in use for GO 003 for five years with no known problems.

## **11. CONCLUSION**

The Northwest Clean Air Agency finds that this evaluation meets all the requirements of New Source Review.

For more information, please contact:

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## 12. ACRONYMS AND ABBREVIATIONS

AAQS	Ambient Air Quality Standard
aka	Also known as
ASIL	Acceptable Source Impact Level
BACT	Best Available Control Technology
bhp	Brake Horsepower
CARB	California Air Resources Board
CFR	Code of Federal Regulations
Ecology	Washington State Department of Ecology
EO	Executive Order
EPA	Environmental Protection Agency
EVR	Enhanced Vapor Recovery
GDF	Gasoline Dispensing Facility
NAAQS	National Ambient Air Quality Standard
NWCAA	Northwest Clean Air Agency
ppm	parts per million
ppmv	parts per million by volume
ppmdv	parts per million by volume, dry (water vapor removed from gas stream)
RCW	Revised Code of Washington
SO <sub>2</sub>	Sulfur Dioxide
tpy	Tons per year
TSD	Technical Support Document
TSP	Total Suspended Particulate
UST	Underground Storage Tank
VOC	Volatile Organic Compounds
WAC	Washington Administrative Code

**APPENDIX A: GO 003R1**



**Northwest Clean Air Agency  
General Order of Approval GO 003R1  
Gasoline Dispensing Facilities  
Effective **September 9, 2015****

This General Order is applicable to any source applying for coverage within the jurisdiction of the Northwest Clean Air Agency (Island, Skagit, and Whatcom Counties, excluding tribal lands).

Pursuant to the state of Washington Clean Air Act Chapter 70.94 Revised Code of Washington (RCW) and the Northwest Clean Air Agency (NWCAA) Regulation, NWCAA finds the following:



## FINDINGS

1. Any new gasoline dispensing facility (GDF) proposing to operate in the NWCAA jurisdiction may request coverage under this General Order.
2. A GDF cannot obtain coverage under this Order if it is an existing GDF at the time of application, if it proposes to remove Stage II vapor recovery equipment, or if it is required to install Stage II vapor recovery equipment according to WAC 173-491-040(5)(c).
3. A GDF cannot obtain coverage under this Order if it is part of a source subject to Section 322 of the NWCAA Regulation (Air Operating Permit Program).
4. The applicant must apply for coverage under this General Order by submitting an Application for Coverage to the NWCAA at:  

1600 South Second Street  
Mount Vernon, WA 98273-5202  
(360) 428-1617

or on the internet at [www.nwcleanairwa.gov](http://www.nwcleanairwa.gov).
5. The proposed GDF, if constructed and operated in accordance with the Application for Coverage, this General Order, and the associated Technical Support Document, will meet the requirements for Best Available Control Technology (BACT) for criteria pollutants.
6. Coverage under this General Order of Approval is effective 30 days after receipt by NWCAA of an Application for Coverage under this General Order of Approval, unless NWCAA has notified the applicant in writing that the application is incomplete or the General Order does not apply to the proposed facility. If the application is incomplete, NWCAA will notify the applicant of the information needed to complete the application. If the NWCAA determines that the General Order does not apply, NWCAA will notify the applicant of the reasons why the General Order does not apply.
7. This General Order and the availability of emission control techniques will be reviewed at least every 5 years after issuance of the Order. If changes are needed, NWCAA will revise and re-issue the General Order. Facilities approved and operating under a previous version of this General Order must continue to comply with the previous General Order. The revised General Order will only apply to new GDFs that did not receive coverage under the previous version of the General Order.

Note that in addition to other applicable rules and regulations, the GDF is subject to applicable portions of the following regulations:

**Northwest Clean Air Agency Regulation**

- Section 580.6 – Gasoline Dispensing Facilities

**National Emission Standards for Hazardous Air Pollutants (NESHAP)**

- 40 CFR 63 Subpart A – General Provisions
- 40 CFR 63 Subpart CCCCCC - National Emission Standards for Hazardous Air Pollutants: Gasoline Dispensing Facilities

**THEREFORE, IT IS ORDERED** that a GDF constructed and operated in accordance with this Application for Coverage, this General Order and the associated Technical Support Document, dated **September 9, 2015**, is hereby approved subject to the following restrictions and conditions<sup>13</sup>.

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Pursuant to Section 300.10 of the NWCAA Regulation and ch 43.21B RCW, this Order may be appealed to the Pollution Control Hearings Board (PCHB). To appeal to the PCHB, a written notice of appeal must be filed with the PCHB and a copy served upon the NWCAA within 30 days of the date the applicant receives this Order. Additional information regarding appeal procedures can be found at: [www.eho.wa.gov](http://www.eho.wa.gov) under PCHB.

### APPROVAL CONDITIONS

1. Install, operate, test and maintain Stage I vapor recovery equipment in a vapor tight manner in accordance with one of the following California Air Resources Board (CARB) Executive Orders: VR-101 (Phil Tite), VR-102 (OPW), VR-104 (CNI Manufacturing), VR-105 (Emco Wheaton), VR-401 (OPW), or VR-402 (Morrison Brothers).
2. All hoses used at the facility must be low-permeation as listed in CARB NVR-1-E.
3. Within 60 days after the date of first pumping gasoline from a dispenser, and every 3 years thereafter, the Stage I vapor recovery system must be tested as described in the relevant CARB Executive Order.
4. In addition to testing prescribed by the relevant CARB Executive Order, conduct a test according to the CARB Vapor Recovery Test Procedure TP-201.1E – Leak Rate and Cracking Pressure of Pressure/Vacuum Vent Valves according to the following table:

GDF Throughput	Frequency
30,000 to 119,999 gal/yr	Every 5 calendar years
120,000 to 1,200,000 gal/yr	Every 3 calendar years
> 1,200,000 gal/yr	Every calendar year

5. Notify NWCAA within 24 hours of any failed CARB Executive Order compliance tests, if the defective equipment cannot be repaired or replaced by the person conducting the test on the day of the test. If the defective equipment cannot be repaired within 14 calendar days of failing a test, the owner or operator must stop receiving and dispensing gasoline from the defective equipment until it is repaired and retested, and passes all required compliance tests. This does not include any operation of the equipment necessary to conduct a retest.
6. Do not handle gasoline in a manner that would result in vapor releases to the atmosphere for extended periods of time. Measures to be taken include, but are not limited to, the following:
  - (1) Minimize gasoline spills;
  - (2) Clean up spills as expeditiously as practicable;
  - (3) Cover all open gasoline containers and all gasoline storage tank fill-pipes with a gasketed seal when not in use;
  - (4) Equip all gasoline tank vent pipes at the GDF with properly functioning pressure vacuum vent caps;
  - (5) Minimize gasoline sent to open waste collection systems that collect and transport gasoline to reclamation and recycling devices, such as oil/water separators.
7. Provide written notification to Northwest Clean Air Agency no later than 7 days after first dispensing gasoline at the facility.

**APPROVED BY:**

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Christos Christoforou, P.E.  
Engineer  
Northwest Clean Air Agency

Date

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Agata McIntyre, P.E.  
Engineering Manager  
Northwest Clean Air Agency

Date