

North Carolina
Department of Environmental Quality
Division of Air Quality
Chemical Accident Prevention Program

112(r) End-of-Year Report for Federal Fiscal Year 2016

Introduction:

This annual report is a summary of activities of the North Carolina Chemical Accident Prevention Program for the United States Environmental Protection Agency's (EPA) federal fiscal year (FFY) 2016 (October 1, 2015 - September 30, 2016) and work plan for FFY 2017. This report is meant to fulfill reporting requirements contained within FFY 2016 Section 105 Grant Commitment Item # 8 titled "Implement the CAA section 112(r) program for affected sources" for the Region 4 – Air Planning Agreement's Monitoring and Enforcement Section.

Background:

40 CFR Part 68 "Chemical Accident Prevention Provisions" is a federal regulation designed to meet the chemical accident prevention requirements within Section 112(r) of the 1990 Clean Air Act Amendment (CAAA). In North Carolina, EPA delegated implementation and enforcement authority for 40 CFR Part 68 to the North Carolina Division of Air Quality (DAQ). DAQ incorporated 40 CFR Part 68 by reference into State rules under 15A NCAC 2D .2100, "Risk Management Program."

Program Implementation:

The primary mission of the North Carolina Chemical Accident Prevention Program is to promote accidental chemical release prevention measures and reduce the impact of releases that do occur on the environment and public health through safety programs, emergency preparedness, and public access to information. In order to achieve these goals, the following objectives have been established:

- 1) **Strategic Planning:** To coordinate chemical accident prevention activities with existing health and safety programs.
 - a) **Memorandum of Agreements (MOA):** As part of the implementation strategy, DAQ continues agreements with partner agencies including:
 - i) Division of Emergency Management (DEM) to assist with emergency planning activities
 - ii) NC Occupational Safety and Health (OSHNC) to support related chemical accident prevention programs.
 - b) **112(r) Task Force:** In order to promote consistency among DAQ's seven regional offices and its partner agencies, an internal work group meets quarterly.
- 2) **Regulatory Review and Enforcement:** To determine compliance with 15A NCAC 2D .2100.

- a) Air Permitted Facility Inspections: In Title V of the CAAA, section 502(b)(5)(A), Congress mandated that a permitting authority must have the authority to “ensure compliance by all sources required to have a permit under this title with each applicable standard, regulation or requirement under this act.” 15A NCAC 2D .2100 is an “applicable requirement.” In general, the permitting authority must ensure that permits include conditions relative to 15A NCAC 2D .2100. In addition, DAQ has opted to include 112(r) compliance statements in all Title V, Synthetic Minor and Minor facility permits. For this reporting cycle:
- i) Title V facilities: 15A NCAC 2D .2104(a); 40 CFR Part 68.215(e)(1) was addressed as a potential applicable requirement in two hundred ninety-four (294) title V facility inspections;
 - ii) Synthetic Minor facilities: 15A NCAC 2D .2104(a); 40 CFR Part 68(e)(1) was addressed as a potential applicable requirement in six hundred twenty-five (625) synthetic minor facility inspections; and
 - iii) Minor facilities: 15A NCAC 2D .2104(a); 40 CFR Part 68(e)(1) was addressed as a potential applicable requirement in nine hundred eighty-eight (988) minor facility inspections.
- b) Risk Management Plan (RMP) Screening: By utilizing industry submitted RMP as mandated by §68.190, EPA’s Central Data Exchange was used to screen data on a regular basis for reporting inconsistencies to include but not limited to failure to update plans, new stationary sources, deregistered stationary sources, errors in RMP submissions, and other required updates.
- c) RMP Inspections: In order to evaluate compliance with 15A NCAC 2D .2100, subject stationary sources are scheduled for routine inspections of their risk management program. Inspections consist of a records review of all program elements, employee interviews, and on-site inspection of regulated processes.

For the reporting cycle, DAQ’s implementing strategy includes an inspection target of 40% of subject stationary sources identified by EPA as “High Risk.” To ensure that each subject stationary source is inspected at least once every five (5) years, the implementing strategy also includes an inspection target of 20% of the remaining stationary sources. For this reporting cycle:

- i) “High Risk” facility inspections: Of the two hundred twenty (220) stationary sources under the jurisdiction of this program, EPA identified twenty-one (21) as “High Risk.” For this reporting cycle, eight (8) stationary sources were targeted for inspection for an inspection rate of 38% (see **Figure 1**).
- ii) Inspections: Of the remaining one hundred ninety-nine (199) stationary sources, forty (40) were targeted for inspection. Of those scheduled, forty-three (43) facilities were inspected for the reporting cycle for a 22% inspection rate (see **Figure 1**).

FFY 2016 112(r) Inspection Target (October 1, 2015 to September 30, 2016)											
DAQ	Total Facilities	5-Year Inspection Cycle					"High Risk" Insp. Target				
		Facilities	20% Insp. Rate	Facilities Inspected	Percent Complete	Remaining	Total "High Risk"	40% Insp. Rate	Facilities Inspected	Percent Complete	Remaining
ARO	23	21	4	4	20%	0	2	0	0	0%	0
FRO	28	25	5	7	30%	-2	3	2	2	70%	0
MRO	55	48	10	10	20%	0	7	3	3	40%	0
RRO	45	41	8	9	20%	-1	4	1	1	30%	0
WaRO	15	15	3	3	20%	0	0	0	0	0%	0
WIRO	16	14	3	3	20%	0	2	1	1	50%	0
WSRO	38	35	7	7	20%	0	3	1	1	30%	0
Total:	220	199	40	43	22%	-3	21	8	8	38%	0

Figure 1: RMP inspection summary

- d) Incident Investigations: Investigations into accidental chemical releases are initiated by DAQ whenever initial reports appear to involve or have the potential to involve a regulated substance at a facility. Audits are conducted whenever the investigation determines that the incident may have resulted in a catastrophic release as defined by 40 CFR Part 68. For this reporting cycle, nineteen (19) reports of accidental chemical releases involving regulated substances at facilities were identified. Of those, none appeared to have resulted in a catastrophic release. Of those reported incidents:
- i) RMP stationary sources: Eighteen (18) incidents were determined to have occurred at stationary sources subject to 40 CFR Part 68. Of those incidents, fourteen (14) involved the release of anhydrous ammonia. Since none of the reported incidents appeared to result in a catastrophic release, investigations into each of the incidents were limited to ensuring that the subject stationary source conducted incident investigations as mandated by §68.60 or §68.81 when appropriate.
 - ii) General duty: One (1) incident was determined to have occurred at a stationary source with less than threshold quantities of the regulated substance and therefore only subject to the general duty clause as mandated by the Clean Air Act Section 112(r)(1). Since it did not appear to have resulted in a catastrophic release, investigation into the incident was limited to ensuring that the facility was not subject to 40 CFR Part 68.
- e) Enforcement Actions: By utilizing the compliance tools mentioned in sections 3a – 3d above, regulated stationary sources may be assessed civil penalties when violations of 15A NCAC 2D .2100 occur. For the reporting cycle, fifty-two (52) separate inspections resulted in thirteen (13) compliance actions totaling sixty-five (65) individual citations (see Figure 3).
- i) Notice of Deficiency (NOD): NODs are issued for “minor violations” of 15A NCAC 2D .2100 observed during the 112(r) inspection at a facility (first offense). Of the compliance actions referenced above, nine (9) resulted in NODs.

- ii) Notice of Violation (NOV): NOV's are issued to subject facilities with a prior history of non-compliance, continued non-compliance with issued NODs, and for minor violations of 15A NCAC 2D .2100 at facilities with a history of catastrophic releases. Of the compliance actions referenced above, four (4) resulted in NOV's.
- iii) Notice of Recommendation for Enforcement (NRE): NRE's are issued to any facility that is in violation of 15A NCAC 2D .2100 (second and subsequent offenses or first offense for a facility with a history of accidental releases), numerous and/or severe violations of 15A NCAC 2D .2100 (first offense and thereafter), and for the failure of a facility subject to 15A NCAC 2D .2100 to submit a Risk Management Plan to EPA. Of the compliance actions referenced above, none resulted in NRE's.

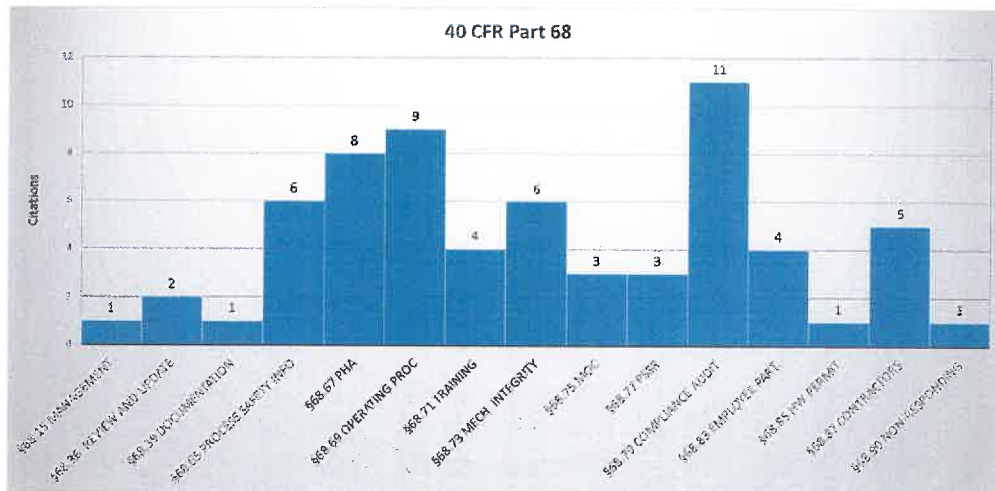


Figure 2: Breakdown of Individual Citations

- 3) **Emergency Planning and Compliance Assistance:** To provide technical assistance to the regulated community, emergency responders, and interested members of the public.
 - a) **Outreach:** To promote awareness of Superfund Amendments and Reauthorization Act (SARA) Title III and the 112(r) Program to include:
 - i) Presented to multiple Local Emergency Planning Committees (LEPCs) to include: Caldwell, Alamance, Anson, Stanly, Craven, Wayne, Jackson, Macon, and Swain Counties;
 - ii) Multiple presentations to the North Carolina Rural Water Association;
 - iii) Presented to the American Society of Safety Engineers (ASSE).
 - b) **Program Coordination:** To participate in meetings with the objective of supporting issues related to the mission of the program to include:
 - i) Completed Regional Chemical Risk Assessments for Mecklenburg, Gaston, and Union Counties.
 - ii) Started Regional Chemical Risk Assessments for Davidson, Guilford, Forsyth, and Alamance Counties.

- iii) Participated in multiple program coordination meetings to include the North Carolina Chemical, Biological, Radiological, Nuclear, and Explosives (CBRNE) Task Force, North Carolina Regional Response Team (RRT), and the North Carolina State Emergency Response Commission (NC SERC).
 - iv) Participated in multiple conferences to include the National Association of SARA Title II Program Officials (NASTTPO), Wake County Business Environmental and Safety Training (BEST) Conference, North Carolina Emergency Management (NCEM) Fall Conference, E-Plan Conference, and the Sandhill’s Ag Terror Response Summit.
- 4) **RMP Trends Analysis:** In order to assess effectiveness, a set of performance indicators was used to evaluate success of the program. Since it is not possible to prove how many accidents were prevented, performance indicators were limited to measuring reductions in potential impacts. These indicators include measuring changes in community vulnerabilities, number of subject stationary sources, and measuring impacts from associated chemical accidents. For this reporting cycle:
- a) **Modeling:** Using data that identified hazard zones, an assessment of possible offsite impacts for 2015 revealed an increase in the total population within these hazard zones by approximately one hundred twenty-two thousand (122,747) or an increase of 3.46%. Over the last ten years, there continues to be an overall downward trend in the population identified within these hazard zones by approximately one million one hundred thousand (-1,195,417) or a decrease of -20.32%. Using population estimates from the U.S. Census Bureau, the population within North Carolina over the same ten-year time frame is estimated to have increased by approximately one million one hundred thousand (1,197,459) or an increase of 14.92% (See Figure 3).

Change in NC Population within OCA(s)						
Calendar Year	NC Census	% Change in NC Population	Population within Hazard Zones	% Change in Population within OCA	Population within Toxic OCA	Population Within Flammable OCA
2005	8,661,061	----	4,819,301	----	4,814,306	4,995
2006	8,845,343	2.13%	4,865,795	0.96%	4,860,262	5,533
2007	9,041,594	2.22%	3,980,524	-18.19%	3,975,014	5,510
2008	9,222,414	2.00%	3,769,569	-5.30%	3,763,943	5,626
2009	9,380,884	1.72%	2,966,424	-21.31%	2,961,232	5,192
2010	9,535,483	1.65%	2,959,864	-0.22%	2,954,307	5,557
2011	9,656,401	1.27%	2,898,373	-2.08%	2,891,747	6,626
2012	9,752,073	0.99%	2,868,964	-1.01%	2,862,422	6,542
2013	9,848,060	0.98%	2,906,549	1.31%	2,898,792	7,757
2014	9,943,964	0.97%	3,547,631	22.06%	3,540,544	7,087
2015	10,042,802	0.99%	3,670,378	3.46%	3,664,374	6,004
* Total Change:	1,197,459	14.92%	-1,195,417	-20.32%	-1,195,888	471

* Note: 2005 was used as reference year.

Figure 3: Change in at risk population by year for the last 10 years

- b) **Stationary Sources:** An assessment of the number of regulated stationary sources reported to have current RMP in North Carolina indicated an increase of two (2) stationary sources from the previous year. Over the last ten years, the overall trend of subject stationary sources continues to trend downward by thirty-seven (-37) stationary sources or a decrease of -11.2% and by forty (-40) regulated processes or a decrease of -14.5%. During the same time period, the total quantity of regulated substances reported in RMP continues to show an increased trend in total quantities by approximately one hundred fourteen million pounds (114,114,238 lbs.) or an increase of 151.7% (see Figure 4).

RMP Regulated Facility Data								
Calendar Year	Facilities	% Change in Facilities	Processes	% Change in Processes	Quantity of RS (lbs.)	% Change in RS	Toxic RS (lbs.)	Flammable RS (lbs.)
2005	275	-----	381	-----	61,106,906	-----	44,072,935	17,033,971
2006	282	2.5%	380	0.3%	55,765,984	-8.7%	43,903,288	11,862,696
2007	280	-0.7%	376	-1.4%	128,626,426	130.7%	41,883,026	86,743,400
2008	279	-0.4%	375	-0.3%	131,537,988	2.3%	41,966,608	89,571,380
2009	263	-5.7%	356	-5.8%	126,013,917	-4.2%	37,885,155	88,128,762
2010	262	-0.4%	352	-0.9%	125,688,294	-0.3%	37,698,623	87,989,671
2011	258	-1.5%	345	-1.6%	142,078,062	13.0%	38,499,105	103,578,957
2012	246	-4.7%	336	-2.9%	143,683,275	1.1%	40,604,318	103,078,957
2013	244	-0.8%	343	-1.0%	165,335,066	15.1%	58,627,549	106,707,517
2014	243	-0.4%	340	-0.9%	169,681,001	2.6%	63,007,859	106,673,142
2015	245	0.8%	340	0.0%	169,880,222	0.1%	63,199,068	106,681,154
Total Change	-37	-11.2%	-40	-14.5%	114,114,238	151.7%	19,295,780	94,818,458

Figure 4: Change in total regulated stationary sources by year for last ten years

- c) **Accidental Releases:** An assessment of chemical accident history data reported under section §68.195 revealed that there have been thirty-nine (39) reported accidents over the last ten years. Of those reported, equipment failure was identified as the most common cause of the accidental release at 68% followed by human error at 29%. Of the regulated substances involved, anhydrous ammonia (CAS # 7664-41-7) was the most commonly reported substance released at 50% followed by chlorine (CAS # 7782-50-5) at 20%. As the chart below indicates, the reported releases resulted in significant impacts to the community including five (5) fatalities, one hundred twenty-one (121) injuries, almost three thousand (2,960) evacuated or asked to shelter-in-place (SIP), and resulted in estimated millions of dollars in property damage from the total release of approximately forty-five thousand pounds (45,843 lbs.) of regulated substances (see Figure 5).

Year	Accidents	Fatalities	Injuries	Evacuation / SIP	Property Damage	Quantity Released (lbs)
2006	5	0	5	0	\$6,000	563
2007	5	0	2	0	\$500	13
2008	3	0	1	0	\$0	615
2009	9	5	92	55	\$50,000,000	19,678
2010	0	0	0	0	\$0	0
2011	8	0	1	305	\$17,100,000	20,102
2012	5	0	9	0	\$0	479
2013	3	0	1	100	\$700	2,420
2014	1	0	10	2,500	\$3,400,000	1,973
2015	0	0	0	0	\$0	0
Totals	39	5	121	2,960	70,507,200	45,843

Figure 5: Yearly summary of reported accidental releases

- 5) **Work Plan for FFY 2017:** In order to focus on key priorities, it is important to identify techniques that are effective in the prevention of accidental chemical releases of regulated substances and the reduction in the severity of those releases that do occur. For FFY 2017 priorities include:
- a) **Strategic Planning:** Continue building partnerships with existing health and safety programs by:
 - i) DEM: Continuing to promote chemical hazard mitigation planning.
 - ii) OSHNC: Continuing to support the process safety management standard.
 - b) **Regulatory Review and Enforcement:** Continue to promote effective chemical risk management programs through:
 - i) Air Permitted facilities: Continue to ensure that air permitted facility representatives address RMP applicability as part of their air permit.
 - ii) **RMP Screening:** Review RMP data received from EPA's Central Data Exchange for reporting inconsistencies to include but not limited to failure to update plans, new stationary sources, deregistered stationary sources, errors in RMP submissions, and other required updates.
 - iii) RMP Inspections: Inspect at least 20% of all regulated facilities and at least 40% of EPA designated "High Risk" facilities annually. Also, ensure that all RMP regulated facilities are inspected at least once every five years.
 - iv) Investigate Incidents: Investigate reports of chemical accidents involving regulated substances at fixed facilities.
 - v) Enforcement Actions: Utilize enforcement authority when violations occur.
 - c) **Emergency Planning and Compliance Assistance:** Plan for handling accidental chemical releases.

- i) **Outreach:** Promote awareness of Superfund Amendments and Reauthorization Act (SARA) Title III and the 112(r) Program.
- ii) **Coordination:** Participate in meetings with the objective of supporting issues related to the mission of the program.
- d) **Trends Analysis:** Continue to measure effectiveness of the program through identified performance indicators such as reductions in community vulnerabilities to releases of regulated substances, number of subject facilities, and impacts from associated chemical accidents.