

STATEMENT OF BASIS

For the issuance of Draft Air Permit # 0868-AOP-R22 AFIN: 70-00016

1. PERMITTING AUTHORITY:

Division of Environmental Quality
5301 Northshore Drive
North Little Rock, Arkansas 72118-5317

2. APPLICANT:

Lion Oil Company
1005 Robert E. Lee St.
El Dorado, Arkansas 71730

3. PERMIT WRITER:

Shawn Hutchings

4. NAICS DESCRIPTION AND CODE:

NAICS Description: Petroleum Refineries
NAICS Code: 324110

5. ALL SUBMITTALS:

The following is a list of ALL permit applications included in this permit revision.

Date of Application	Type of Application (New, Renewal, Modification, Deminimis/Minor Mod, or Administrative Amendment)	Short Description of Any Changes That Would Be Considered New or Modified Emissions
9/6/2023	Minor Modification	5 tanks, one emergency engine

6. REVIEWER'S NOTES:

Lion Oil Company LLC ("Lion") owns and operates a petroleum refinery located in El Dorado, Union County, Arkansas. This permit is to:

- Replace 4 tanks and add one new tank to the Tank Group Source, SN-856. The four tank replacements will be in-kind replacements of existing tanks (Tanks 82, 84, 245, and 271). The new tank, Tank 203, is a "swing" tank with an 80,000 barrel capacity.

- Install a new emergency generator to support the radio tower in the event of a power outage. The proposed Radio Tower Generator, SN-879, is a 14-kilowatt (kW) gas-fired engine that will be operated using propane gas.

Permitted emission rates increased 0.1 tpy of Particulate, SO₂, VOC, CO and 0.3 tpy of NO_x

7. COMPLIANCE STATUS:

The following summarizes the current compliance of the facility including active/pending enforcement actions and recent compliance activities and issues.

There are no known enforcement issues with the facility.

8. PSD/GHG APPLICABILITY:

a) Did the facility undergo PSD review in this permit (i.e., BACT, Modeling, etc.)? N
If yes, were GHG emission increases significant? N

b) Is the facility categorized as a major source for PSD? Y

- *Single pollutant ≥ 100 tpy and on the list of 28 or single pollutant ≥ 250 tpy and not on list*

If yes for 8(b), explain why this permit modification is not PSD. The past actual to future actual emissions combined with new source emissions were below PSD thresholds.

9. SOURCE AND POLLUTANT SPECIFIC REGULATORY APPLICABILITY:

Source	Pollutant	Regulation (NSPS, NESHAP or PSD)
Tanks (permit has table)	VOC HAPs	NSPS Ka NSPS Kb NSPS UU MACT CC
SN-821		NSPS Db
SN-850 and 862		NSPS Dc
Facility		NSPS J
FCCU SN-809, SN-805N, 822, 823, 876	NO _x , H ₂ S	NSPS Ja
Wastewater system		NSPS QQQ
Leaks		NSPS VV
		NSPS GGG
SN-864, 865, 870, 871		NSPS IIII
Benzene Waste Operations	Benzene	NESHAP Part 61 FF
Refinery MACT	HAPs	MACT CC
868 870 871 879	HAPs	MACT ZZZZ
867 879	Criteria	NSPS JJJJ

10. UNCONSTRUCTED SOURCES:

Unconstructed Source	Permit Approval Date	Extension Requested Date	Extension Approval Date	If Greater than 18 Months without Approval, List Reason for Continued Inclusion in Permit
None				

11. PERMIT SHIELD – TITLE V PERMITS ONLY:

Did the facility request a permit shield in this application? N – Existing one remains from previous permits. The source added in this modification was removed.

(Note - permit shields are not allowed to be added, but existing ones can remain, for minor modification applications or any Rule 18 requirement.)

12. COMPLIANCE ASSURANCE MONITORING (CAM) – TITLE V PERMITS ONLY:

List sources potentially subject to CAM because they use a control device to achieve compliance and have pre-control emissions of at least 100 percent of the major source level. List the pollutant of concern and a brief summary of the CAM plan (temperature monitoring, CEMs, opacity monitoring, etc.) and frequency requirements of § 64.

Source	Pollutant Controlled	Cite Exemption or CAM Plan Monitoring and Frequency
None		

13. EMISSION CHANGES AND FEE CALCULATION:

See emission change and fee calculation spreadsheet in Appendix A.

14. AMBIENT AIR EVALUATIONS:

The following are results for ambient air evaluations or modeling.

a) NAAQS

A NAAQS evaluation is not required under the Arkansas State Implementation Plan, National Ambient Air Quality Standards, Infrastructure SIPs and NAAQS SIP per Ark. Code Ann. § 8-4-318, dated March 2017 and the DEQ Air Permit Screening Modeling Instructions.

b) Non-Criteria Pollutants:

The non-criteria pollutants listed below were evaluated in permit. Based on Division of Environmental Quality procedures for review of non-criteria pollutants, emissions of all other non-criteria pollutants are below thresholds of concern.

1st Tier Screening (PAER)

Estimated hourly emissions from the following sources were compared to the Presumptively Acceptable Emission Rate (PAER) for each compound. The Division of Environmental Quality has deemed the PAER to be the product, in lb/hr, of 0.11 and the Threshold Limit Value (mg/m^3), as listed by the American Conference of Governmental Industrial Hygienists (ACGIH).

Pollutant	TLV (mg/m^3)	PAER (lb/hr) = $0.11 \times \text{TLV}$	Proposed lb/hr	Pass?
Acrolein	0.229	0.02519	0.0578	No
Ammonia	174.13	1.915	36.766	No
Antimony	0.5	0.05	0.00127	Yes
Arsenic	0.01	0.0011	0.00198	No
Beryllium	0.00005	0.0000055	0.000556	No
Cadmium	0.002	0.00022	0.00351	No
Chromium	0.002	0.00022	0.008086	No
Cobalt	0.02	0.0022	0.000233	Yes
Formaldehyde	0.368	0.0405	0.7266	No
Lead	0.05	0.0055	0.0103	No
Manganese	0.02	0.0022	0.0136	No
Mercury	0.01	0.0011	0.000698	Yes
Nickel	1.5	0.165	0.0222	Yes
Sulfuric Acid	0.2	0.022	1.948	No
Xylenes	434.19	47.761	23.083	Yes

2nd Tier Screening (PAIL)

AERMOD air dispersion modeling was performed on the estimated hourly emissions from the following sources, in order to predict ambient concentrations beyond the property boundary. The Presumptively Acceptable Impact Level (PAIL) for each

compound has been deemed by the Division of Environmental Quality to be one one-hundredth of the Threshold Limit Value as listed by the ACGIH.

Pollutant	PAIL ($\mu\text{g}/\text{m}^3$) = 1/100 of Threshold Limit Value	Modeled Concentration ($\mu\text{g}/\text{m}^3$)	Pass?
Acrolein	2.29	0.15308	Yes
Ammonia	174.13	12.14659	Yes
Arsenic	0.1	0.00122	Yes
Beryllium	0.0005	0.00036	Yes
Cadmium	0.02	0.00178	Yes
Chromium	0.02	0.00349	Yes
Formaldehyde	15*	1.57153	Yes
Lead	0.5	0.00674	Yes
Manganese	0.2	0.00923	Yes
Sulfuric Acid	2.0	1.26225	Yes

*ADEQ approved alternate PAIL

c) H₂S Modeling:

A.C.A. §8-3-103 requires hydrogen sulfide emissions to meet specific ambient standards. Many sources are exempt from this regulation, refer to the Arkansas Code for details.

Is the facility exempt from the H₂S Standards

Y

If exempt, explain: Facility is subject to NSPS Subpart J and Subpart GGG [A.C.A. §8-3-103(d)(2)(ii)(a) and (d)] _____

15. CALCULATIONS:

SN	Emission Factor Source (AP-42, testing, etc.)	Emission Factor (lb/ton, lb/hr, etc.)	Control Equipment	Control Equipment Efficiency	Comments
803	PM, VOC AP-42 SO ₂ Subpart J H ₂ S Limit CO NO _x Vendor Data	<u>lb/MMBtu</u> PM/PM ₁₀ : 0.0075 SO ₂ : 0.0337 VOC: 0.0054 CO: 0.0495 NO _x : 0.0350	none		

SN	Emission Factor Source (AP-42, testing, etc.)	Emission Factor (lb/ton, lb/hr, etc.)	Control Equipment	Control Equipment Efficiency	Comments
		Total HAP: 0.00265			
804	PM, VOC AP-42 SO ₂ Subpart J H ₂ S Limit CO NO _x BACT	<u>lb/MMBtu</u> PM/PM ₁₀ : 0.0075 SO ₂ : 0.0337 VOC: 0.0054 CO: 0.0400 NO _x : 0.0450 Total HAP: 0.00265			
805	PM, VOC AP-42 SO ₂ Subpart J H ₂ S Limit CO NO _x Vendor Data	<u>lb/MMBtu</u> PM/PM ₁₀ : 0.0075 SO ₂ : 0.0337 VOC: 0.0054 CO: 0.0625 NO _x : 0.0350 Total HAP: 0.00265			
805N	PM, VOC AP-42 SO ₂ Subpart J H ₂ S Limit CO NO _x BACT	<u>lb/MMBtu</u> PM/PM ₁₀ : 0.0075 SO ₂ : 0.0337 VOC: 0.0054 CO: 0.0400 NO _x : 0.0350 Total HAP: 0.00265			
806	PM, VOC, CO, NO _x AP-42 SO ₂ NSPS Limit	<u>lb/MMBtu</u> PM/PM ₁₀ : 0.0075 SO ₂ : 0.0337 VOC: 0.0054 CO: 0.0824 NO _x : 0.140 Total HAP: 0.00265			
808	PM, VOC, CO AP-42	<u>lb/MMBtu</u> PM/PM ₁₀ : 0.0075			

SN	Emission Factor Source (AP-42, testing, etc.)	Emission Factor (lb/ton, lb/hr, etc.)	Control Equipment	Control Equipment Efficiency	Comments
	SO ₂ Subpart J H ₂ S Limit NO _x Vendor Data	SO ₂ : 0.036 VOC: 0.0054 CO: 0.0824 NO _x : 0.0350 Total HAP: 0.00265			
809	PM, VOC, CO consent Decree limit VOC NO _x AP-42	See table in application			
810 811 812 813a 814	PM, VOC, CO, NO _x AP-42 SO ₂ NSPS Limit	<u>lb/MMBtu</u> PM/PM ₁₀ : 0.0075 SO ₂ : 0.0336 VOC: 0.0054 CO: 0.0824 NO _x : 0.140 Total HAP: 0.00265			
821a,b,c	PM VOC Ap-42 NO _x SO ₂ NSPS Limits CO MACT Limit	<u>lb/MMBtu</u> PM/PM ₁₀ : 0.0117 SO ₂ : 0.0336 VOC: 0.0147 CO: 0.7126 NO _x : 0.0300 Total HAP: 0.00326			
821d	AP-42 Section 1.4	<u>lb/MMscf</u> VOC: 5.5 SO ₂ : 0.6 PM/PM ₁₀ : 7.6 NO _x : 50 CO: 84 Total HAP: 1.89			99.9 MMBtu/hr natural gas Temporary boiler
822 823 876	VOC 99.5% destruction SO ₂ NSPS Limit PM CO NO _x AP-42	<u>lb/MMcf</u> VOC: 93.7 SO ₂ : 26.9 PM/PM ₁₀ : 11.0 NO _x : 68.0	Flare	99.5% VOC	

SN	Emission Factor Source (AP-42, testing, etc.)	Emission Factor (lb/ton, lb/hr, etc.)	Control Equipment	Control Equipment Efficiency	Comments
	H ₂ S and NH ₃ CARB refinery factors	CO: 370 NH ₃ : 3.33 H ₂ S: 1.9			
828 829 830 832 842 850	PM, VOC, CO, NO _x AP-42 SO ₂ NSPS Limit	<u>lb/MMBtu</u> PM/PM ₁₀ : 0.0075 SO ₂ : 0.0336 VOC: 0.0054 CO: 0.0824 NO _x : 0.140 Total HAP: 0.00265			
831	Manufacturer vendor data	<u>lb/hr</u> PM/PM ₁₀ : 2.0 SO ₂ : 2.0 VOC: 2.0 CO: 2.6 NO _x : 2.0			
841A	PM SO ₂ VOC AP-42 CO NO _x Vendor Information	<u>g/hp-hr</u> CO: 3 NO _x : 2 <u>lb/MMBtu</u> PM/PM ₁₀ : 0.0384 SO ₂ : 0.000588 VOC: 0.12 Total HAP: 0.0744			
844	PM Stack test SO ₂ NSPS limits VOC CO NO _x vendor data	<u>lb/hr</u> PM/PM ₁₀ : 12 SO ₂ : 19.10 VOC: 1.5 CO: 8.1 NO _x : 6 <u>lb/ton</u> Carbonyl Sulfide: 0.12 Carbon Disulfide: 0.04			
846	MACT Limit	VOC: 3.505 lb/10 ³ bbl			

SN	Emission Factor Source (AP-42, testing, etc.)	Emission Factor (lb/ton, lb/hr, etc.)	Control Equipment	Control Equipment Efficiency	Comments
		Total HAP: 5.84 wt %			
847 847A 873	AP-42	<u>lb/hr</u> VOC: 647.2 Total HAP: 33.09			
849	AP-42	<u>lb/hp-hr</u> PM/PM ₁₀ : 0.0022 SO ₂ : 0.0019 VOC: 0.0025 CO: 0.01874 NO _x : 0.031 Total HAP: 2.77E-05			
851A	AP-42	VOC/HAP: 0.0195 lb/10 ³ gal			
853	AP-42	VOC: 0.7 lb/MMgallons PM/PM ₁₀ : 1500 ppm			
851	Leak estimation	See table in application			
856	AP-42 TANKS	<u>lb/hr</u> PM/PM ₁₀ : 16.40 VOC: 5728.20 CO: 123.60 Ammonia: 3.30			
857 860 861 862	PM, VOC, CO, AP-42 SO ₂ NSPS Limit NO _x Vendor Guarantee	<u>lb/MMBtu</u> PM/PM ₁₀ : 0.0117 SO ₂ : 0.0337 VOC: 0.0147 CO: 0.0824 NO _x : 0.0350 Total HAP: 0.00265			
864 865	AP-42 Or NSPS limits.	<u>lb/hp-hr</u>			

SN	Emission Factor Source (AP-42, testing, etc.)	Emission Factor (lb/ton, lb/hr, etc.)	Control Equipment	Control Equipment Efficiency	Comments
866 867 868 DS-028 879		PM/PM ₁₀ : 0.00028 SO ₂ : 0.00205 VOC: 0.00609 CO: 0.00214 NO _x : 0.00609 Total HAP: 2.78E-05			
874	AP-42 11.17.4	2.2 lb/ton	none		
876	Uncontrolled: AP-42 Section 5.2 Controlled: 5x MACT CC statement of 20ppm	Equation 100ppm	None Yes unspecified		
878	AP-42 Tables 1.4-2, 1.4-3, 1.4-4, and 1.5-1 Worst-case mass balance	<u>Off-Gas Combustion</u> <u>(lb/MMcf)</u> PM/PM ₁₀ : 7.6 SO: 4617 VOC: 5.5 CO: 84 NO _x : 190 Lead: 0.0005 HAPs: 1.894 <u>Propane Combustion</u> PM/PM ₁₀ : 0.7 lb/10 ³ gal SO: 0.015 lb/10 ³ gal VOC: 1.0 lb/10 ³ gal CO: 7.5 lb/10 ³ gal NO _x : 13.0 lb/10 ³ gal	Up to 5 TOs in operation		0.0066 MMscf/hr and 2.50 MMscf/yr off-gas volume

SN	Emission Factor Source (AP-42, testing, etc.)	Emission Factor (lb/ton, lb/hr, etc.)	Control Equipment	Control Equipment Efficiency	Comments
		Lead: 4.90E-07 lb/MMBtu HAPs: 0.00185 lb/MMBtu			

16. TESTING REQUIREMENTS:

The permit requires testing of the following sources.

SN	Pollutants	Test Method	Test Interval	Justification
804, 805N	CO NO _x	10, 7E	5 years	BACT compliance demonstration
809	PM	5 or 5B	Annual	NSPS
809	PM ₁₀ filterable and condensable	5B and 202	5 years	
841A	CO NO _x	10, 7E	5 years	
844	H ₂ S	15	One Time	Facility current permit has 360 tons of H ₂ S. The application did not include any H ₂ S emissions. This is the most likely source to emit H ₂ S. Test to verify no H ₂ S emissions.
846	Vapor System	Method 21	One Time	MACT requirement

17. MONITORING OR CEMS:

The permittee must monitor the following parameters with CEMS or other monitoring equipment (temperature, pressure differential, etc.)

SN	Parameter or Pollutant to be Monitored	Method (CEM, Pressure Gauge, etc.)	Frequency	Report (Y/N)
803, 805, 808, 810, and 842	O ₂	CPMS	Continuous	Y
811, 804	NO _x	CEMs	Continuous	Y
809	NO _x SO ₂ CO	CEMs	Continuous	Y
809	hourly average pressure drop, liquid feed rate, and exhaust gas flow rate	CPMS	Continuous	Y
809	of CO ₂ , O ₂ , (dry basis), and if needed, CO	CEMs	Continuous	Y
844	SO ₂		Continuous	Y
821a, 821b, 821c	CO NO _x		Continuous	Y
854 858f	Leaks		Monthly	Y
Refinery gas	SO ₂ or H ₂ S	CEMs	Continuous	Y
UUU requirements	CO and SO ₂	CEMs	Continuous	Y
846	Organics	CMS	Continuous	Y

18. RECORDKEEPING REQUIREMENTS:

The following are items (such as throughput, fuel usage, VOC content, etc.) that must be tracked and recorded.

SN	Recorded Item	Permit Limit	Frequency	Report (Y/N)
803 804 805 805N 806 808 810 811 812 813a 814 830 842 850	Annual BTU	See Condition FHR 3	Monthly	Yes

SN	Recorded Item	Permit Limit	Frequency	Report (Y/N)
857 860 861				
850 and 862	Fuel Combusted	No limit Dc record	Monthly	Yes
809	Coke burn off rate	11,700-15,000 lb coke burn-off per hour (FCCU 11)	Monthly	Yes
809	Compressor hp hrs	1,560,000 horsepower- hours on an annual basis	Monthly	Yes
821	MMBTU total	5,314,320 MMBtu	Monthly	Yes
821	Fuel Oil Combusted and sulfur content	No limit	Monthly	Yes
822 823	Gas flared	6 MM scf/day and a total limit of 486 MM scf per consecutive twelve months	Daily and Monthly	Yes
841A	ZZZZ Records	No limit	Per Event	Yes
846	Gasoline/diesel	12,775,000 bbl per 12 mo	Monthly	Yes
847	VOC Emissions	647.2 lb/hr 282.9 tpy	Monthly	Yes
849	Hours	1900 per 12 mo	Monthly	Yes
849	Sulfur content	0.5%	For each fuel	Yes
851a	Wastewater processed	1,064.6 MM gal	Monthly	Yes
851a	NSPS Subpart QQQ	No limit see condition WW5	As required	Yes
853/a/b 859	Billion gallons of water circulated in Cooling Towers per 12 mo	Total: 55.8 #5: 13.26 #8: 10.5 #7: 6.4	Monthly	Yes
854 and 854f	Component Inventory	No limit	Annual	Yes
854 and 854f	NSPS GGG Records	No limit see condition LEAK 4	As required	Yes

SN	Recorded Item	Permit Limit	Frequency	Report (Y/N)
854 and 854f	NSPS VV Records	No limit see condition LEAK 5	As required	Yes
856 tanks and facility	Crude feed rate	100,000 bbl/day 36.6 MM bbls per 12 mo	Monthly	Yes
856	Ka records	No limit See Condition TANK 7	Monthly	Yes
856	Kb records	No limit	As required	Yes
856-FRAC	When done, what loaded, vapor pressure, control efficiency, emissions	Permit Emission Limits. Size Limits/vapor pressure limits	As required	Yes
869	MACT EEEE Records	No limits	As required	Yes
Benzene Waste Operations	40 CFR 61 Subpart FF Records	No limits	As required	Yes
MACT CC sources	MACT CC Records	No limits	As required	Yes
Subpart J sources	NSPS J records	No limits	As required	Yes
MACT UUU sources	MACT UUU Records	No limits	As required	Yes
Engines (867, 868, 870, 871, 879)	Hours and MACT/NSPS Records	500 hrs/calendar year	Monthly	Yes
873	Material Loaded	500,000 light liq. 1,000,000 heavy/12 mo	Monthly	Yes
874	Catalyst Loaded	1,400,000 lbs/12 mo	Monthly	Yes
877	Cleaning Events	1,040/12 mo	Monthly	No
878	Number of TOs, amount of fuel and off-gas combusted, sulfur content of off-gas, and total emissions	Specific Conditions TO 5 and TO 6	Monthly	Yes

SN	Recorded Item	Permit Limit	Frequency	Report (Y/N)
Facility	Total HAP emissions	391.3 lb/hr 1062.7 tpy	Annually	No

19. OPACITY:

SN	Opacity	Justification for limit	Compliance Mechanism
803 804 805 805N 806 808 810 811 812 813a 814 821d 832 841A	5%	Department Guidance	NSPS J or Ja gas combustion only
809	20%	Department Guidance	NSPS Ja and proper scrubber operation
821a,b,c	5% gas 20% fuel oil	Department Guidance	J Ja or pipeline gas Daily observation
822 and 823 876	No visible except 60% not to exceed 5 min in any 2 hours	NSPS Requirement	Operate flare in accordance with NSPS
831	20%	Department Guidance	NSPS J gas only
844	20%	Department Guidance	Pipeline gas only
849	20%	Department Guidance	N/A
856	0%	NSPS Subpart UU	See Condition TANK 11
878	20%	Department Guidance	Weekly Observations
867, 868, and 879	5%	Department Guidance	Propane and Natural Gas Combustion only

20. DELETED CONDITIONS:

Former SC	Justification for removal
	none

21. GROUP A INSIGNIFICANT ACTIVITIES:

The following is a list of Insignificant Activities including revisions by this permit.

Source Name	Group A Category	Emissions (tpy)						
		PM/PM ₁₀	SO ₂	VOC	CO	NO _x	HAPs	
							Single	Total
Portable Maintenance Heaters (Up to 200 each fuel type)	A-1	3.24	0.86	0.63	4.64	9.24		0.63
Up to 250 A-2 Tanks	A-2			<5.0				<5.0
Up to 18 A-3 Tanks	A-3			4.48				
(3) Waste Oil Tanks	A-3			0.48				
Equipment Coating	A-13			0.09				
TAR Fugitive Road Dust	A-13	0.16						
Acid Fume Scrubber	A-13	0.01						
Lime Silo Baghouse	A-13	0.12						
Asphalt Protective Coating Baghouse	A-13	0.01						

22. VOIDED, SUPERSEDED, OR SUBSUMED PERMITS:

The following is a list of all active permits voided/superseded/subsumed by the issuance of this permit.

Permit #
0868-AOP-R21

APPENDIX A – EMISSION CHANGES AND FEE CALCULATION

Fee Calculation for Major Source

Revised 03-11-16

Lion Oil Company
 Permit #: 0868-AOP-R22
 AFIN: 70-00016

\$/ton factor	27.27	Annual Chargeable Emissions (tpy)	5788.7
Permit Type	Minor Mod	Permit Fee \$	500

Minor Modification Fee \$	500
Minimum Modification Fee \$	1000
Renewal with Minor Modification \$	500
Check if Facility Holds an Active Minor Source or Minor Source General Permit	<input type="checkbox"/>
If Hold Active Permit, Amt of Last Annual Air Permit Invoice \$	0
Total Permit Fee Chargeable Emissions (tpy)	0.5
Initial Title V Permit Fee Chargeable Emissions (tpy)	

HAPs not included in VOC or PM:

Chlorine, Hydrazine, HCl, HF, Methyl Chloroform, Methylene Chloride, Phosphine, Tetrachloroethylene, Titanium Tetrachloride

Air Contaminants:

All air contaminants are chargeable unless they are included in other totals (e.g., H2SO4 in condensible PM, H2S in TRS, etc.)

Pollutant (tpy)	Check if Chargeable Emission	Old Permit	New Permit	Change in Emissions	Permit Fee Chargeable Emissions	Annual Chargeable Emissions
PM		286.7	286.8	0.1		
PM ₁₀		286.7	286.8	0.1	0.1	286.8
PM _{2.5}				0		
SO ₂		445.4	445.5	0.1	0.1	445.5
VOC		6579.6	6579.7	0.1	0	4000
CO		936.2	936.3	0.1		
NO _x		634.3	634.6	0.3	0.3	634.6
Lead	<input type="checkbox"/>	0.0376702	0.0376702	0		

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