



John D. Lovenburg  
Vice President  
Environment & Sustainability

**BNSF Railway Company**  
2500 Lou Menk Dr, AOB-3  
Fort Worth, TX 76131-2828

March 31, 2022

California Air Resources Board  
Attn: Ajay Mangat, Freight Transport Branch  
Transportation and Toxics Division  
1001 I Street, 6th Floor  
Sacramento, CA 95814

Dear Mr. Mangat:

Attached, please find BNSF Railway's Fleet Average report of 2021 as required by the 1998 Memorandum of Mutual Understanding and Agreements (1998 MOU) between the California Air Resources Board, BNSF Railway and Union Pacific Railroad. BNSF Railway's final fleet average for 2021 was **4.8** grams per brake horsepower-hour (g/bhp-hr).

I certify that the enclosed report is submitted on behalf of BNSF and that the information is, to the best of BNSF's knowledge and belief, true, accurate, and complete, and is consistent with the requirements of the 1998 MOU.

If you have any questions or comments related to the this report, please contact Ashley Lane via email at [ashley.lane2@bnsf.com](mailto:ashley.lane2@bnsf.com) or phone at (913) 551-4599.

Sincerely,

A handwritten signature in blue ink that reads "John Lovenburg".

John Lovenburg  
Vice President  
Environment & Sustainability  
BNSF Railway

South Coast Locomotive Fleet Average Emission Program

ANNUAL COMPLIANCE REPORT  
FOR  
CALENDAR YEAR  
2021

Submitted by a Participating Railroad  
to the  
California Air Resources Board  
in Accordance with the  
Memorandum of Mutual Understanding and Agreements  
Dated  
2-Jul-98

Version: March 18, 2022  
Participating Railroad: BNSF  
Date Submitted: March, 2022

**Form F-A-2**

**Calculation of Final FA in accordance with Subsection III.D of Memorandum**

A. Enter the value shown on Line D of Part III of Form F-A-1	4.8
B. Enter the total of all adjustments made to FA in accordance with paragraph III.D.1 of the Memorandum. If any adjustment is made to FA, complete Part II of Form F-A-3.	0.0
C. Calculate adjusted FA (Line A - Line B)	4.8
D. If Line C is less than or equal to Fleet Average Target, or if this report is for a year prior to 2010, enter zero. Otherwise, enter any correction made to account for atmospheric conditions in accordance with paragraph III.D.2 of the Memorandum. Do not enter more than the difference between Line C and Fleet Average Target. If a correction is made to account for atmospheric conditions, complete Part III of Form F-A-3.	0.0
E. Calculate Adjusted/Corrected FA (Line C - Line D); Round to nearest 0.1 g/bhphr (see Appendix C of Memorandum)	4.8
F. FAC from ULELs in g/bhphr (the smaller of Line B or Line E; round to the nearest 0.1 g/bhphr)	0.0
G. Calculate Final FA in g/bhphr (Line E - Line F)	4.8

	8.0388
Fleet Average Target $((1-y) \times 15.4 \text{ g/bhp-hr})$	5.5

**Form F-A-3**

Form F-A-3 is related to adjustment of the locomotive CL, FA and correction to FA - Not Applicable

**Form F-A-4**

**Factors to Convert between Gallons of Fuel and MWhr**

Locomotive Type:	conversions were made for each model including conversion factors utilized.
A. Indicate whether original data for the locomotive were collected in gallons of fuel or MWhr.	Both
B. What conversion factor was used?	See conversion factors for locomotives in Whitepaper Appendix A.
C. Has the methodology used to develop the conversion factor been accepted previously by California Air Resources Board (ARB) in accordance with the terms of Appendix D of the Memorandum?	
D. If Line C Is Yes, enter date.	
E. Show below, in detail, how the conversion factor was calculated. Attach all supporting data and evidence. This information will be used by ARB to determine whether to accept the conversion factor. If Line C is No, it will also be used to determine whether to accept the methodology. See paragraphs IV.C.4, IV.C.5 and Appendix B of the Memorandum.	See Whitepaper

**Form F-A-5**

**Estimation of Missing Locomotives - Not applicable**

**Form F-A-6**

**Summary of FAC Transactions (in g/bhphr)**

	(1)	(2)	(3)
	Created Pre-2010	Created Post-2009	Total
A. Ending FAC balance -- last annual report	2.2	3.11	5.31
B. FAC acquired for Other Participating Railroad since last annual report, if any	0.0	0.00	0.00
C. FAC created from ULELs during the year, if any (Line F of Form F-D-2)	0.0	0.90	0.90
D. FAC transferred to Other Participating Railroad or others since last annual report, if any	0.0	0.00	0.00
E. Total FAC available for use in this annual report -- subject to restrictions on pre-2010 FAC noted in subparagraph III.D.3.a of Memorandum (Line A + Line B + Line C - Line D)	2.2	4.01	6.21
F. FAC used in this annual report, if any (included in total emissions reductions shown on Line F of Form F-A-2)	0.0	0.13	0.13
G. FAC created during the year other than Line C, if any (Fleet Average Target # - Final FA shown on Line G of Form F-A-2, provided Fleet Average Target # exceeds Final FA)	0.66	0.00	0.66
H. Ending FAC balance -- this annual report (Line E-LineF+LineG)	2.86	3.11	5.97

**II. Emissions Reductions Other than FAC**

List the amount of emissions reductions other than FAC, if any, shown on Line F of Form F-A-2 (in g/bhphr). In accordance with subparagraph III.D.3.a of the Memorandum, this amount cannot exceed 0.3 g/bhphr. In addition, the sum of (1) the amount shown here, and (2) the pre-2010 FAC included on Line F of Form F-A-2 (and shown on Line F, column 1 of Part I of this Form F-A-6 cannot exceed 1.3 g/bhphr.	0
Attach documentation for the above emissions reductions other than FAC, including a description of the reductions, how acquired, date acquired, and amount acquired. Note that subparagraph III.D.3.a and Appendix E of the Memorandum stipulate a fixed conversion rate from tons to g/bhphr.	None

**III. Reconciliation of Line F of Form F-A-2**

A. Show amount from Line F, column 3 of Part I of this Form F-A-6.	0.1
B. Show amount from Part II of this Form F-A-6.	0.0



C. Line A + Line B (should equal line F from Form F-A-2)	0.1
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