R.L. BANKS & ASSOCIATES, INC.
ECONOMICS | ENGINEERING | SERVICE PLANNING

**IN THE UNITED STATES DISTRICT COURT
FOR THE NORTHERN DISTRICT OF CALIFORNIA
SAN FRANCISCO DIVISION**

Civil Action No. 3:16-cv-07014-VC

Oakland Bulk and Oversized Terminal (Plaintiff)
v.
City of Oakland (Defendant)

The Honorable Vince Chhabria, Judge

EXPERT REPORT
OF
Stephen M. Sullivan

ON BEHALF OF THE DEFENDANT

OCTOBER 6, 2017

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Intro & Summary

I, Stephen M. Sullivan, have been retained by The City of Oakland, defendant in this Case, through its attorneys, Burke, Williams & Sorensen, LLP ("counsel"), to provide an expert opinion on railroad operations and more specifically, to assess the proposed railroad service within the Port of Oakland and within the former Oakland Army Base with a particular focus on railroad coal train operations at the proposed OBOT facility.

Currently I am Managing Director of R.L. Banks & Associates Inc. ("RLBA"), a railroad consulting company founded in 1956. I have more than 35 years of experience in the railroad field, holding operations and management positions. In my role at RLBA, I have provided expert railroad operations analysis to clients engaged in proceedings before the Surface Transportation Board, which has jurisdiction over railroad rate and service issues, and other litigation matters. I joined RLBA in 2013.

Prior to joining RLBA, I served for twelve years as the Vice President and Executive Director of The American Short Line and Regional Railroad Association ("ASLRRA"), an industry organization composed of hundreds of smaller railroad entities. In that capacity, I represented the interests of members on a number of topics, including railroad operations; interchange issues, regulatory compliance, customer service disputes, and industry car movement standards and performance. During that time, I served on a number of railroad industry committees and regularly interacted with Union Pacific Railroad, and the other largest railroads in the country on a variety of railroad operating issues.

Before joining the ASLRRA, I worked at Conrail, a railroad that served the northeastern United States from 1976 to 1999, and its predecessor railroads, for 25 years. I started as brakeman and conductor before being promoted to Terminal Trainmaster at Stanley Yard, a major railway yard in Toledo, Ohio. I later served as Supervisor of Rules and Operating Practices and as District Superintendent of Operations in Northern Ohio – Southern Michigan. I then transitioned to Conrail's corporate management team, holding the titles of Manager of Commercial Planning, Manager of Capital Planning, Director of Strategic Planning, and Director of Corporate Strategy.

My expert report consists of four areas, 1) a review and assessment of the of the type of railroad service being proposed for the Port of Oakland and the former Oakland Army Base, 2) an evaluation of the capabilities of west coast ports to handle trains carrying export coal, 3) an analysis of the proposed coal train operations at the OBOT facility, and 4) an evaluation of the impact of the release of fugitive coal dust resulting from the proposed coal train operations at the OBOT facility.

The opinions and conclusions provided herein are based on information available to date. Discovery in this lawsuit is ongoing, and I understand that the parties continue to provide additional information that may be relevant to my opinions, including information underlying the opinions of OBOT's expert witnesses. I will review additional depositions, exhibits, and documents that may be made available at a later date as necessary. After reviewing any additional material, I reserve the right to supplement and disclose any additional opinions, if necessary.My compensation is not contingent on my conclusions, and I have no financial interest in the outcome of this litigation.

I. Oakland Global Rail Enterprises (OGRE) Rail Operations within the Port of Oakland and City-Owned Portion of former Army Base

The Rail Master Plan[1] includes a design for new construction and re-construction of rail infrastructure within the Port of Oakland (an independent department of the City, governed by the Board of Port Commissioners and Port of Oakland staff) and the City-owned portions of the former Oakland Army Base. As of the writing of this report, Oakland Global Rail Enterprises (OGRE) has been proposed to be the operator of rail services within the newly designed Port-owned and City-owned property.

While most of the new rail infrastructure is yet to be built, the proposed rail build-out upon which OGRE seeks to operate is identified in a series of maps appearing as figures in a rail access agreement that the City is currently negotiating with the Port. OGRE is at the same time negotiating a rail operating agreement with the Port. The property on which OGRE proposes to operate is hereafter defined as the "OAB Rail." A good representation of the proposed rail infrastructure appears on a land rights map of permanent lease and easement areas, prepared for developer CCIG Oakland Global, LLC (Oakland Global)[2] dated 12/1/2015, a copy of which is attached to this report referencing key locations as described in the following text.

OGRE will interface with Union Pacific Railroad (UP) and will receive and deliver (Interchange) rail traffic with UP at newly constructed yards referred to in the rail access agreement as the support yard and the manifest yard (reference point "1" on the attached map). In fact, part of the support yard is currently in operation handling trans-loading of hazardous dirt into rail cars which are then positioned for movement to UP. On the Oakland Global map, these yards appear to the north of 7th Street and to the west of the Union Pacific Railroad property. Again, using the Oakland Global map for reference, OGRE would move rail traffic from these support yards through the Port of Oakland in a northerly, counter clockwise movement, initially over a

[1] Oakland Army Base Rail Master Plan Report; prepared for CCIG Oakland Global LLC by HDR Engineering, Inc., January, 2012
[2] Oakland Global, Port & City – Permanent Lease/Easement Areas, Land Rights, City of Oakland, Alameda County, California Drawing No. X-1796

single lead track (reference point "2" on the attached map), north of the yards, then increasing to two lead tracks just to the north of West Grand Avenue which passes over Port property on an elevated roadway (reference point "3" on the attached map). From this point, OGRE will provide all railroad switching for customers within the Port of Oakland from one or both of these lead tracks up to property leased by OBOT from the City (reference point "4" on the attached map), beginning just west of West Burma Road.

Upon entering property leased by OBOT from the City, on private industry lead tracks from the point west of West Burma Road where OBOT control begins, OGRE will delivers cars to the facility. RLBA understands that from that point, the Terminal operator will conduct switching and unloading operations, moving cars around the facility and unloading cars, likely using ILWU crews and Terminal operator equipment (car movers, indexers, car dumpers, etc.).[3] OGRE will deliver loaded cars to the West Gateway, upon which private facility tracks are located, for its switching and handling, and remove empty cars therefrom once switching and handling is completed.

II. Inventory of Coal Export Terminals along the Pacific Coast

RLBA developed an inventory of coal export terminals along the Pacific coasts of Canada, Mexico and the United States to determine the amounts of existing and potential additional coal export capacity, which would illustrate the size of the market in which the prospective Port of Oakland, TLS-OBOT coal export terminal would compete. The inventory was developed by reviewing websites, articles, reports and presentations found via internet searches. Sources are presented in footnotes where appropriate. Most of the capacity data were originally published during 2012 – 2013, with additional data published during 2014 – 2015.

[3] Bates @ OB082061 – TLS Operating Plan Framework, June 19,2015 & OB215980 Email from Marcel Veilleux to Stotka McClure and Tagami re ILWU Unloading and Rail Details, May 30,2014

The detailed inventory, which is broken down to the individual port and terminal locations, is presented in Appendix A of this report. The prospective coal export terminal at Oakland is included in the inventory at Reference Line Number 23.

Seventeen existing and prospective terminals were identified by RLBA and appear in the inventory. They have been segmented into three status categories:

- Existing terminals ("Existing") are operating;
- Prospective terminal projects ("Prospective – Suspended") are proposed projects which have been suspended, and
- Prospective projects which are pending ("Prospective – Pending") are proposed projects which are in various stages of development and permitting. The Oakland export coal terminal, which is the subject of the case at hand, has been characterized by RLBA as one of two such terminals on the U.S. Pacific coast and one of five such terminals along the Canadian – U.S. – Mexican Pacific coast.

A summary tally of the seventeen terminals and their capacities, by status category, country and state is presented below in Figure 1.

Figure 1[4]

Summary Tally of Seventeen Pacific Coast Export Coal Terminals and Their Capacities By Status, Country and State

Reference Line Number	Coal Terminal Status as of September 2017	Terminal Location: Country	Terminal Location: State	Number of Terminals	Annual Capacity (million short tons) (1): Current	Annual Capacity (million short tons) (1): Potential Additional
1	Existing	CAN		3	57.5	18.0
2		USA	AK	2	3.2	0.0
3			CA	3	5.9	1.0
4	**Total: Existing**			**8**	**66.6**	**19.0**
5						
6	Prospective - Suspended	USA	OR	3	0.0	35.0 - 39.0
7			WA	1	0.0	48.0
8	**Total: Prospective - Suspended**			**4**	**0.0**	**83.0 - 87.0**
9						
10	Propective - Pending	MEX		3	0.0	34.3 - 37.3
11		USA	CA	1	0.0	4.5 - 5.5
12			WA	1	0.0	28.0 - 49.0
13	**Total: Prospective - Pending**			**5**	**0.0**	**66.8 - 91.8**
14						
15	**Grand Total**			**17**	**66.6**	**168.8 - 197.8**
16						
17	**Grand Total Net of "Prospective - Suspended" Terminals**			**13**	**66.6**	**85.8 - 110.8**

Notes:
(1) Most of the capacity values presented here are from sources dated 2012 and 2013.

Key observations from Figure 1 are:

1. Current capacity:
    a. Current (generally as of 2012 – 2013) coal export capacity at eight existing terminals on the Pacific coast is 66.6 million short tons (MMst) per year (Reference Line Number 4) and 57.5 MMst (Reference Line Number 1) (86 percent) of that capacity resides at the three terminals in Vancouver (Neptune

[4] Figure 1 is a summary of the detailed inventory which appears in Appendix A.

Bulk Terminal and Westshore Terminal) and Prince Rupert (Ridley Terminal), British Columbia, Canada.

b. The three California terminals at Long Beach, Richmond and Stockton represent 5.9 MMst (9 percent) of current coal exporting capacity.

2. Potential additional capacity:

   a. The thirteen terminals composed of eight Existing and five Prospect – Pending terminals (Line 13) represent 85.8 to 110.8 MMst of potential additional coal export capacity (Line 17).

   b. Of the three Existing terminals in California only one, Metropolitan Bulk Terminal at the Port of Stockton, has indicated the potential to add capacity, 1.0 MMst.

3. Suspended projects:

   a. Four coal export terminal projects have been suspended (Coos Bay, OR; Morrow, OR; St. Helens, OR and Cherry Point, WA). All were suspended due to environmental – health and safety issues.

   b. These four suspended projects might be reactivated as a result of successful reapplication to the Oregon and Washington departments of environmental quality for authority to operate, which ultimately could result in added coal export capacity along the Pacific coast.

4. Actual Tonnage shipped:

   a. Of the eight existing terminals, three are in California and three are in the Canadian province of British Columbia. All six are accessible via the North American rail network from the origin coal mines in Utah, the subject coal origins in this case. All six of these export coal terminals, have excess capacity and could easily handle the projected TLS-OBOT tonnage at one or more of the terminals. The combined surplus capacity at the California terminals was 2.9 and 4.4 MMst in 2015 and 2016, respectively, as illustrated in Figure 2 below. The combined surplus capacity at the three Canadian terminals in 2013, 2014 and 2015 was

51.30, 44.98 and 47.54 MMst, respectively, as illustrated in the subsequent Figure 3.

Figure 2

Surplus Capacity Exists at Three California Coal Export Terminals

Reference Column Number	A	B	C	D	E	F	G	H	I	J	K	L
									Combined Annual Actual Throughput (million short tons) (5)		Combined Surplus Capacity (million short tons)	
Reference Line Number	**Coal Terminal Status as of September 2017**	**Country**	**State**	**Port Location**	**Coal Terminal Name**	**Location Source (See "Notes")**	**Current Annual Capacity (million short tons)**	**Capacity Source (See "Notes")**	**2015**	**2016**	**2015**	**2016**
1	Existing	USA	CA	Long Beach	Oxbow Terminal	1, 2	2.4	2				
2	Existing	USA	CA	Richmond	Levin - Richmond Terminal	1, 2	1.5	2	3.0	1.5	2.9	4.4
3	Existing	USA	CA	Stockton	Metropolitan Bulk Terminal	1, 2, 3	2.0	2, 4				
4		**Total: USA - CA, Existing**					**5.9**		**3.0**	**1.5**	**2.9**	**4.4**

Notes:

1) List of Ports from the Pacific Maritime Association. http://www.pmanet.org/port-locations-stats accessed 9/19/2017
2) "Existing and Potential Coal Export Infrastructure," 2013 JTB Port Capacity and Projections List (pdf),
at http://www.uscoalexports.org/how-us-coal-is-exported accessed 9/30/2017.
The pdf can be accessed directly at: http://www.uscoalexports.org/data/Coal-Port-Capacity-and-Projections.pdf
3) "Port of Stockton," at https://www.sourcewatch.org/index.php/Port_of_Stockton accessesd 10/1/2017.
4) "Goods Movement by Rail: A Historical Perspective and Glimpse into our Current and Future Economy," San Joaquin Council of Governments,
May 21, 2013, slide 29 at http://www.sjcog.org/documentcenter/view/252 accessed 10/1/2017.
5) Presentation before the National Coal Transportation Association, "Status of U.S. Coal Exports, " Finn Host, Executive Vice President,
T. Parker Host, Inc., April 2017, slides 37.

Figure 3

Surplus Capacity Exists at Three Canadian Coal Export Terminals

Reference Column Number	A	B	C	D	E	F	G	H	I	J	K	L	M	N
									Combined Annual Actual Throughput (million short tons) (3)			**Combined Surplus Capacity (million short tons)**		
Reference Line Number	**Coal Terminal Status as of September 2017**	**Country**	**State**	**Port Location**	**Coal Terminal Name**	**Location Source (See "Notes")**	**Current Annual Capacity (million short tons)**	**Capacity Source (See "Notes")**	**2013**	**2014**	**2015**	**2013**	**2014**	**2015**
1	Existing	CAN		Prince Rupert	Ridley Terminal	2	12.0	2						
2	Existing	CAN		Vancouver ("Port Metro")	Neptune Bulk Terminal	2	12.5	2	6.20	12.52	9.96	51.3	44.98	47.54
3	Existing	CAN		Vancouver ("Port Metro")	Westshore Terminal	1, 2	33.0	2						
4		**Total: CAN, Existing**					**57.5**		**6.20**	**12.52**	**9.96**	**51.30**	**44.98**	**47.54**

Notes:

1) List of Ports from the Pacific Maritime Association. http://www.pmanet.org/port-locations-stats accessed 9/19/2017

2) "Existing and Potential Coal Export Infrastructure," 2013 JTB Port Capacity and Projections List (pdf), http://www.uscoalexports.org/how-us-coal-is-exported accessed 9/30/2017. The pdf can be accessed directly at: http://www.uscoalexports.org/data/Coal-Port-Capacity-and-Projections.pdf

3) Presentation before the National Coal Transportation Association, "Status of U.S. Coal Exports, " Finn Host, Executive Vice President, T. Parker Host, Inc., April 2017, slides 33.

Appendix A

Inventory of Coal Export Terminals on the Pacific Coast and Their Capacities

Covering Canada, Mexico and the United States

Inventory of Coal Export Terminals on the Pacific Coast and Their Capacities Covering Canada, Mexico and the United States

Reference Column Number	A	B	C	D	E	F	G	H	I	J
							Annual Capacity (million short tons)			
Reference Line Number	Coal Terminal Status as of September 2017	Country	State	Port Location	Coal Terminal Name	Location Source (See "Notes")	Current	Potential Additional	Capacity Source (See "Notes")	Comments
1	Existing	USA	AK	Anchorage	Port Mackenzie	3	1.0		3	
2	Existing	USA	AK	Seward	Seward Coal Terminal	3	2.2		3	
3	Existing	USA	CA	Long Beach	Oxbow Terminal	1, 3	2.4		3	
4	Existing	USA	CA	Richmond	Levin - Richmond Terminal	1, 3	1.5		3	
5	Existing	USA	CA	Stockton	Metropolitan Bulk Terminal	1, 3, 9	2.0	1.0	3, 10	May 2013 report suggests expansion of coal export capacity to 3 million tons per year. (10)
6		**Total: USA, Existing**					**9.1**	**1.0**		
7										
8	Existing	CAN		Prince Rupert	Ridley Terminal	3	12.0	12.0	3	
9	Existing	CAN		Vancouver ("Port Metro")	Neptune Bulk Terminal	3	12.5	6.0	3	
10	Existing	CAN		Vancouver ("Port Metro")	Westshore Terminal	1, 3	33.0		3	
11		**Total: CAN, Existing**					**57.5**	**18.0**		
12										
13	**Total: Existing**						**66.6**	**19.0**		
14										
15	Prospective - Suspended	USA	OR	Coos Bay	Metro Ports / Mitsui / Korean Electric Power Corp.	1, 3		6 - 10	5	Abandoned 4/1/2013 (12)
16	Prospective - Suspended	USA	OR	Morrow	Morrow Pacfic Project / Lighthouse Resources	3		7.0	3, 4	Abandoned 10/12/2016 (6)
17	Prospective - Suspended	USA	OR	St. Helens	Port Westward / Kinder Morgan	1, 3		22.0	7	Abandoned 5/8/2013 (7)
18	Prospective - Suspended	USA	WA	Cherry Point (Puget Sound)	Gateway Pacific Terminal	3		48.0	3	Abandoned. "On February 7, [2017] the applicant withdrew all permit applications for the project." (4)
19		**Total: USA, Prospective - Suspended**					**0.0**	**83.0 - 87.0**		
20										
21	**Total: Prospective - Suspended**						**0.0**	**83.0 - 87.0**		
22										

Inventory of Coal Export Terminals on the Pacific Coast and Their Capacities Covering Canada, Mexico and the United States (cont'd)

Reference Column Number	A	B	C	D	E	F	G	H	I	J
							Annual Capacity (million short tons)			
Reference Line Number	Coal Terminal Status as of September 2017	Country	State	Port Location	Coal Terminal Name	Location Source (See "Notes")	Current	Potential Additional	Capacity Source (See "Notes")	Comments
23	Prospective - Pending	USA	CA	Oakland	Terminal Logistics			4.5 - 5.5	8	***This project is the subject of the case at hand.***
24	Prospective - Pending	USA	WA	Longview (Columbia River)	Millenium Bulk Terminal	1, 3		28.0 - 49.0	4	Source at Note 3 gives capacity as 33 MMst.
25		**Total: USA, Prospective - Pending**					**0.0**	**32.5 - 54.5**		
26										
27	Prospective - Pending	MEX		Guaymas		3		30.0	13	
28	Prospective - Pennding	MEX		Lazaro Cardenas		3		3.0 - 6.0	5	
29	Prospective - Pending	MEX		Topolobampo		3		1.3	3	
30		**Total: MEX, Prospective - Pending**					**0.0**	**34.3 - 37.3**		
31										
32	**Total: Prospective - Pending**						**0.0**	**66.8 - 91.8**		
33										
34										
35	**Grand Totals**						**66.6**	**168.8 - 197.8**		
36										
37	**Grand Total Net of "Prospective - Suspended" Terminals**						**66.6**	**85.8 - 110.8**		

Notes:

1) List of Ports from the Pacific Maritime Association. http://www.pmanet.org/port-locations-stats accessed 9/19/2017

2) Los Angeles: Dedicated coal terminal closed in 2003. Sylvie Cornot-Gandolphe "US Coal Exports: The Long Road to Asian Markets," Oxford OIES PAPER: CL 2, March 2015; http://www.sourcewatch.org/index.php/Port_of_Los_Angeles#cite_note-2

3) "Existing and Potential Coal Export Infrastructure," 2013 JTB Port Capacity and Projections List (pdf), http://www.uscoalexports.org/how-us-coal-is-exported accessed 9/30/2017. The pdf can be accessed directly at: http://www.uscoalexports.org/data/Coal-Port-Capacity-and-Projections.pdf

4) "U.S. coal exports have increased over the past six months," U.S. Energy Information Agency, July 18, 2017 at https://www.eia.gov/todayinenergy/detail.php?id=32092 accessed 9/29/2017.

5) U.S. Coal Export Terminals at https://www.platts.com/news-feature/2012/coaltransport/map accessed 9/30/2017

Inventory of Coal Export Terminals on the Pacific Coast and Their Capacities Covering Canada, Mexico and the United States (cont'd)

Notes: (cont'd)
6) "Coal company dumps Morrow Pacific Project," George Plaven, East Oregonian, October 13, 2016 at
http://www.eastoregonian.com/eo/local-news/20161013/coal-company-dumps-morrow-pacific-project accessed 09/30/2017.
7) "Kinder Morgan scraps Port Westward coal terminal proposal, Erik Olsen, The Daily News, May 8, 2013 at
http://tdn.com/news/local/kinder-morgan-scraps-port-westward-coal-terminal-proposal/article_c02584f6-b811-11e2-be99-0019bb2963f4.html accessed 9/30/2017.
8) "Army Base Redevelopment Terminal," at http://www.sourcewatch.org/index.php/Port_of_Oakland#cite_note-6 accessed 9/19/2017.
9) "Port of Stockton," at https://www.sourcewatch.org/index.php/Port_of_Stockton accessesd 10/1/2017.
10) "Goods Movement by Rail: A Historical Perspective and Glimpse into our Current and Future Economy," San Joaquin Council of Governments, May 21, 2013, slide 29 at
http://www.sjcog.org/documentcenter/view/252 accessed 10/1/2017.
11) "L.A. Weighs Costly Exit from Coal Terminal," by Patrick McGreevey, Los Angeles Times, June 14, 2003 at accessed 10/1/2017.
http://articles.latimes.com/2003/jun/14/local/me-coal14 accessed 10/1/2017.
12) "Port of Coos Bay coal-export proposal ends after 18 months of work," Scott Learn, The Oregonian, April 1, 2013 at
http://www.oregonlive.com/environment/index.ssf/2013/04/port_of_coos_bay_coal-export_p.html accessed 10/1/2017.
13) "Developers planning massive coal export terminal in Mexico to serve US producers," by Darren Epps at
https://www.snl.com/InteractiveX/article.aspx?cdid=A-28041715-15144&TabStates=0 accessed 10/2/2017.

III. Coal Train Operations

Routing of Proposed Coal Trains between Origin Mines in Utah and the OAB Rail

RLBA has identified two probable Union Pacific Railroad routes, a northern route via Sacramento, CA and a southern route via Stockton, CA, over which the proposed coal trains would operate between Utah and the OAB Rail which appear with mileage details in Figure 4.

Figure 4

Proposed Routing: Savage Coal Terminal, Price, UT to Port of Oakland, CA Via Sacramento, Martinez and San Pablo, CA

Subdivision	Begin Location & Milepost	End Location & Milepost	Total Miles	Running Miles	Notes
Castle Valley Industrial Lead	0	2.6	2.6	2.6	
Green River	Price, UT MP 615.8	Helper, UT MP 626.4	10.6	13.2	
Provo	Helper, UT MP 626.4	Salt Lake City, UT MP 745.8	119.4	132.6	
Lynndyl	Salt Lake City, UT MP 783.7	Smelter, UT MP 766.4	17.3	149.9	
Shafter	Smelter, UT MP 991.5	Alazon, NV MP 713.6	197.9	347.8	
Lakeside	Alazon, NV MP 603.7	Elko, NV MP 557.0	46.7	394.5	
Elko	Elko, NV MP 666.3	Weso, NV MP 535.5	130.8	525.3	
Winnemucca	Weso, NV MP 535.5	Portola, CA MP 322.3	213.2	738.5	Enters CA at MP 378.34
Canyon	Portola, CA MP 322.3	Oroville, CA MP 204.5	113.8	852.3	MP 209.5 = MP 205.5
Sacramento	Oroville, CA MP 204.5	Sacramento, CA MP 139.8	64.7	917	
Martinez	Sacramento, CA MP 90.2	Oakland, CA MP 3.7	86.5	1003.5	

California Milage	321.04 Miles

Oakland Mileage	1.3 Miles

Proposed Routing: Savage Coal Terminal, Price, UT to Port of Oakland, CA Via Stockton, Niles and San Leandro, CA					
Subdivision	Begin Location & Milepost	End Location & Milepost	Total Miles	Running Miles	Notes
Castle Valley Industrial Lead	0	2.6	2.6	2.6	
Green River	Price, UT MP 615.8	Helper, UT MP 626.4	10.6	13.2	
Provo	Helper, UT MP 626.4	Salt Lake City, UT MP 745.8	119.4	132.6	
Lynndyl	Salt Lake City, UT MP 783.7	Smelter, UT MP 766.4	17.3	149.9	
Shafter	Smelter, UT MP 991.5	Alazon, NV MP 713.6	197.9	347.8	
Lakeside	Alazon, NV MP 603.7	Elko, NV MP 557.0	46.7	394.5	
Elko	Elko, NV MP 666.3	Weso, NV MP 535.5	130.8	525.3	
Winnemucca	Weso, NV MP 535.5	Portola, CA MP 322.3	213.2	738.5	Enters CA at MP 378.34
Canyon	Portola, CA MP 322.3	Oroville, CA MP 204.5	113.8	852.3	MP 209.5 = MP 205.5
Sacramento	Oroville, CA MP 204.5	Stockton, CA MP 95.1	109.4	961.7	
Oakland	Stockton, CA MP 93.1	Oakland, CA MP 10.3	82.8	1044.5	
Niles	Oakland, CA MP 10.3	Oakland, CA MP 4.2	6.1	1050.6	

California Milage	368.14 Miles

Oakland Mileage	13.98 Miles

Analysis of Proposed Coal Train Operations over OAB Rail

RLBA was asked to analyze proposed rail operations within the OAB Rail, specifically focusing on the total time, or cycle time of loaded coal trains arriving at the OAB Rail, through the handling and unloading process of these trains to the point where the trains departed OAB Rail as empty coal trains. Whereas the first part of this report defined the operations of Oakland Global Rail Enterprises (OGRE), this portion of the report considers all rail operations with particular focus on coal trains in the Oakland Terminal. In conducting this analysis, RLBA addressed the HDR Engineering, Inc. (HDR) Preliminary Simulation of the Oakland Bulk and Oversize Terminal on behalf of California Capital Investment Group[5]. Section One of this May 2015 report states, "A preliminary spreadsheet simulation (Simulation) was prepared for the Oakland Bulk and Oversize Terminal (OBOT), which is a proposed multi-commodity bulk material facility." The Simulation appears in a separate document also prepared by HDR, titled Basis of Design[6]. In performing the analysis RLBA conducted a head-to-head comparison using a 104-car coal train, the same as in the HDR simulation.[7] RLBA also used HDR's "best-case" assumptions in conducting its analysis. The details of RLBA's analysis and the comparison to HDR's simulation appear in Figure 5.

[5] Preliminary Simulation, Oakland Bulk and Oversized Terminal; Prepared for California Capital Investment Group Oakland Global LLC by HDR Engineering, Inc., May 2015

[6] Basis of Design, Oakland Bulk and Oversized Terminal; Prepared for California Capital Investment Group Oakland Global LLC by HDR Engineering, Inc., May 2015

[7] The HDR simulation was used by RLBA because it is the most current of various representations of coal train operations over OAB Rail into and out of the OBOT facility. RLBA reserves the right to change its analysis and opinion if any of the information in the HDR simulation is updated or revised.

Figure 5

RLBA Comparative Analysis of HDR Simulation

Sheet 1 of 4

Reference Line Number	Activity Number	UPRR or OGRE Function	Switch Activity (Yellow-highlighted activities added by RLBA)	Speed (MPH)	Distance (Feet)	RLBA Simulation Activity Time (Minutes) Durantion	RLBA Simulation Activity Time (Minutes) Running Duration	HDR Simulation Activity Time (Minutes) Duration	HDR Simulation Activity Time (Minutes) Running Duration	Notes
1			INBOUND UP TRAIN							
2	1	UPRR	COM1A - Arrives @ W. Lead of Support Yard @ midnight	5	12,144	27.60	27.60	0.00	0.00	Comes in south end of UP Intermodal Terminal. Gets restricting signal into intermoday facility and must move at restricted speed around the outside track in order to access Unit Train Support Yard, stopping to line switches and derails.
3	2	UPRR	COM1A - Pulls through SY5 onto WGL2	5	7,800	17.73	45.33	17.73	17.73	Crew will not pull onto WGL2, UP will not allow that. Crew will have to come out other end of yard and again line all switches and derails for their movement
4	3	UPRR	Set COM1A- Cut 2 (52 Cars) in SY5/Uncouple(1)	0	-	7.00	52.33	4.00	21.73	Tie down, do securement check. Put DPU in s/o mode.
5	4	UPRR	Pull COM1A-Cut 1 (52 Cars) north to switch SY6	2	600	3.41	55.74	3.41	25.14	
6	5	UPRR	Shove COM1A-Cut 1 back onto SY6	5	3,300	7.50	63.24	9.38	34.52	
7	6	UPRR	Secure COM1A-Cut 1 in SY6	0		7.00	70.24			Tie down, do securement check. Job Brief about power
8	7	UPRR	Take Head End Power to Other End of Yard and retrieve DPU motor	5	3,900	8.86	79.10			
9	8	UPRR	Collect DPU Motor and Take to Service Track	5	2,200	5.00	84.10			
10			GRAVEYARD SHIFT 00:01 - 09:00 (9 hours)							
11	9	OGRE	OGRE1 Switch Engine and Crew Arrive			5.00	89.10	5.00	39.52	UP Crew will take power off of train
12	10	OGRE	Cut Headend Power (HP) and set on open Support Track (or Manifest Yard Track)					5.68	45.20	
13	11	OGRE	OGRE1 Hooks onto COM1A Cut 1 on SY6			7.00	96.10	5.00	50.20	
14	12	OGRE	OGRE1 pulls COM1A-Cut 1 north on WGL2 pulling west past the WGL2 Pit, breaks train	5	9,000	20.45	116.55	25.57	75.77	
15	13	OGRE	OGRE1 leaves COM1A- Cut 1B (26 Cars) in WGL2 (E. of WGL2 Pit)	0	-	7.00	123.55	4.00	79.77	
16	14	OGRE	OGRE1 pulls COM1A-Cut 1A (26 Cars) pass WGL2/3 crossover clearing switch	2	320	1.82	125.37	1.82	81.59	
17	15	OGRE	OGRE1 shoves COM1A-Cut 1A onto WGL3 east of the WGL2 Pit	2	1,820	10.34	135.71	10.34	91.93	
18	16	OGRE	Uncouple OGRE1	0	-	7.00	142.71	5.00	96.93	
19	17	OGRE	OGRE1 returns to SY5 using WGL4 as escape track	5	7,500	8.00	150.71	21.31	118.24	
20	18	OGRE	OGRE1 Couples to COM1A Cut 2, leaving Rearend Power (RP) on SY5	0	-	7.00	157.71	4.00	122.24	UP Crew will take power off the train, including DPU

Figure 5

RLBA Comparative Analysis of HDR Simulation

Sheet 2 of 4

Reference Line Number	Activity Number	UPRR or OGRE Function	Switch Activity (Yellow-highlighted activities added by RLBA)	Speed (MPH)	Distance (Feet)	RLBA Simulation Activity Time (Minutes) Durantion	RLBA Simulation Activity Time (Minutes) Running Duration	HDR Simulation Activity Time (Minutes) Duration	HDR Simulation Activity Time (Minutes) Running Duration	Notes
21	19	OGRE	OGRE1 pulls COM1A-Cut 2 north on WGL2 to WGL4 through WGL2 Pit and WGL2/1 Crossover onto WGL1	5	9,000	20.45	178.17	25.57	147.80	
22	20	OGRE	OGRE1 breaks COM1A-Cut 2B (26 Cars) clear of WGL2/1slip switch (W. of Pit)			7.00	185.17	4.00	151.80	
23	21	OGRE	OGRE1 pulls COM1A-Cut 2A (26 Cars) pass WGL2/1 slip switch, set on WGL1	2	320	1.82	186.99	1.82	153.62	
24	22	OGRE	OGRE1 leaves COM1A- Cut 2A (26 Cars) on WGL1			7.00	193.99			
25	23	OGRE	OGRE1 uses tail track to reverse onto WGL2 and pull COM1A-Cut2B onto WGL2 (W. of Pit)	5	1,820	4.14	198.12	10.34	163.96	
26	24	OGRE	OGRE1 returns to SY3 using WGL3/WGL4 as escape track	5	9,000	20.45	218.58	25.57	189.53	
27	25	OGRE	Train dwelling awaiting day shift to come on duty			201.42	390.00	230.47	390.00	
28			DAY SHIFT 6:30 - 17:30 (10 Hrs.)							
29	26	OGRE	**OGRE2 reports for duty @ W. Burma Locomotive Track (30 min)**			30.00	420.00	30.00	420.00	This assumes a locomotive dedicated to unloading operations
30	27	OGRE	OGRE2 crew brings locomotive off pit and travels up WGL4/WGL3 to tail end of COM1A-Cut 2A and couples to cars	5	6,500	14.77	434.77			
31	28	OGRE	OGRE2 shoves COM1A-Cut 2A (26 Cars) on WGL1 east through WGL2 Pit onto WGL4 unloading cars (1.5 min/car)			104.00	538.77	39.00	459.00	This assumes 4 min/car
32	29	OGRE	OGRE2 pulls COM1A-Cut 2A (26 cars) west onto WGL3 for car inspection	2	1,800	10.23	549.00	10.23	469.23	
33	30	OGRE	Uncouple OGRE2, uses Trail track to access WGL2			7.00	556.00	5.00	474.23	
34	31	OGRE	Perform inspection COM1A-Cut2A (work by Carmen, no switch crew involvement)			60.00		60.00	534.23	Inspection for damage per AAR Interchange rules. Has no effect on overall time schedule for completion of unloading of train
35	32	OGRE	OGRE2 couple to COM1A- Cut 2B			10.00	566.00	5.00	539.23	Assumes going from Cut2A to Cut2B and time to untie
36	33	OGRE	OGRE2 shoves COM1A- Cut 2B east onto WGL4, unloading 26 cars (1.5 min/car)			104.00	670.00	39.00	578.23	This assumes 4 min/car
37	34	OGRE	OGRE2 leaves Cut2B on WGL4			7.00	677.00			
38	35	OGRE	Perform inspection COM1A-Cut2B (work by Carmen, no switch crew involvement)			60.00		60.00	638.23	Inspection for damage per AAR Interchange rules. Has no effect on overall time schedule for completion of unloading of train
39	36	OGRE	OGRE2 runs west through WGL4 switch (E. of Pit) onto WGL3, couple with COM1A- Cut 1A			5.00	682.00	5.00	643.23	This assumes 4 min/car

Figure 5

RLBA Comparative Analysis of HDR Simulation

Sheet 3 of 4

Reference Line Number	Activity Number	UPRR or OGRE Function	Switch Activity (Yellow-highlighted activities added by RLBA)	Speed (MPH)	Distance (Feet)	RLBA Simulation Activity Time (Minutes)		HDR Simulation Activity Time (Minutes)		Notes
						Durantion	Running Duration	Duration	Running Duration	
40	37	OGRE	OGRE2 pulls COM1A-Cut 1A (26 cars) west through WGL3/2 crossover to WGL2 Pit unloading cars (1.5min./car)			104.00	786.00	39.00	682.23	
41	38	OGRE	OGRE2 uses tail track to access WGL3 WGL1 (WGL3 is blocked with Cut2A), runs east pass WGL4 WGL2 switch just east of Burma Rd	5	3,000	6.82	792.82			
42	39	OGRE	OGRE2 crew reverses onto WGL2 and couples to Cut1B			7.00	799.82			
43	40	OGRE	OGRE2 crew shoves Cut1B (26 cars) west through WGL2 Pit unloading cars onto WGL1 west of the dumper			104.00	903.82			This assumes 4 min/car
44	41	OGRE	OGRE2 runs east to W. Burma Rd., reverses onto WGL4, connects COM1-Cut2B with COM1-Cut2A	5	1,650	3.75	907.57			
45	42	OGRE	Perform initial air test on COM1A- Cut2, WGL3/2 crossover is blocked			104.00	1011.57			Assumes 2 min/car performing safety inspection and walking
46	43	OGRE	OGRE2 Goes on Lunch Break							Crew does not need to be present while air test is being performed
47	44	OGRE	OGRE2 crew cuts off COM1A-Cut2 and travels east to WGL1 and reverses against Cut1B	5	1,650	3.75	1015.32			
48	45	OGRE	OGRE2 crew couples up to Cut1B			7.00	1022.32			
49	46	OGRE	OGRE2 crew pulls Cut1B through WGL1/2 crossover and shoves against Cut1A on WGL2	2	1,500	8.52	1030.84			
50	47	OGRE	Perform initial air test on COM1A- Cut1, WGL2/1 crossover is blocked			104.00	1134.84			Assumes 2 min/car performing safety inspection and walking
51	48	OGRE	OGRE2 crew pulls Cut1 into SY6	5	9,000	20.45	1155.30			
52	49	OGRE	OGRE2 crew uncouples from Cut1			7.00	1162.30			
53	50	OGRE	OGRE2 crew reverses onto WGL3 and couples to Cut2	5	9,000	20.45	1182.75			
54	51	OGRE	OGRE2 crew pulls Cut2 into SY5	5	9,000	20.45	1203.20			
55	52	OGRE	OGRE2 crew leaves Cut2 in SY5			7.00	1210.20			
56	53	OGRE	OGRE notifies UP train is unloaded and spotted for interchange							
57	54	UPRR	UP road crew called			120.00	1330.20			
58	55	UPRR	UP Yardmaster instructs yard crew to retrieve outbound power from service track and build outbound train			30.00	1240.20			

Figure 5

RLBA Comparative Analysis of HDR Simulation

Sheet 4 of 4

Reference Line Number	Activity Number	UPRR or OGRE Function	Switch Activity (Yellow-highlighted activities added by RLBA)	Speed (MPH)	Distance (Feet)	RLBA Simulation Activity Time (Minutes)		HDR Simulation Activity Time (Minutes)		Notes
						Durantion	Running Duration	Duration	Running Duration	
59	56	UPRR	UP switch crew hostles power from service track to SY5 and places DPU on rear of SY5	5	3,300	7.50	1247.70			
60	57	UPRR	UP switch crew runs head end power down clear track and places on north end of SY6	5	3,800	8.64	1256.34			
61	58	UPRR	UP crew couples to north end of SY6			7.00	1263.34			
62	59	UPRR	UP switch crew pulls out SY6 onto North Lead and couples back onto SY5	2	3,800	21.59	1284.93			
63	60	UPRR	UP mechanical foreman called to link DPU			10.00	1294.93			
64	61	UPRR	Train ready to depart				1294.93			
65	62	UPRR	UP road crew comes on duty				1330.20			
66	63	UPRR	UP Road Crew gathers paperwork, job briefs and gets supplies			60.00	1390.20			Assumes 20-20-20 rule
67	64	UPRR	UP Road Crew vans to head end and boards train. Reports on board and ready to depart			15.00	1405.20			
68	65	OGRE	OGRE2 pulls COM1A- Cut 2 on WGL2 through WGL2/1 crossover west of Wake Rd onto Port Lead 1 (L1),		10,200			28.98	711.21	
69	66	OGRE	OGRE2 hooks COM1A-Cut2 to Headend power and returns to Support Yard using open track					5.00	716.21	
70	67	OGRE	OGRE2 hooks onto COM1B Cut 1 on SY5					8.80	725.01	
71	68	OGRE	OGRE2 Goes on Lunch Break					60.00	785.01	
72			SWING SHIFT 10:30 - 21:30 (10 Hrs.)						785.01	
73	69	OGRE	OGRE3 uses tail track to reverse onto WGL2 and hooks to COM1A-Cut1A (empties)					1.82	786.83	
74	70	OGRE	OGRE3 Shoves COM1A-Cut1A back through WGL2 Pit onto WGL4					10.23	797.06	
75	71	OGRE	OGRE3 pulls COM1A-Cut1A back through WGL3 west of WGL2 Pit for inspection					10.23	807.29	
76	72	OGRE	Perform inspection COM1A-Cut1A (work by Carmen, no switch crew involvement)					60.00	867.29	
77	73	OGRE	OGRE3 uses tail track to reverse onto WGL2 and run east through WGL2 Pit to connect to COM1A-CutB on WGL2					10.23	877.52	
78	74	OGRE	OGRE3 pulls COM1A-Cut1B west through WGL2 Pit unloading 26 cars (1.5 min/car)					39.00	916.52	
79	75	OGRE	OGRE3 shoves COM1A-Cut1B east onto WGL4 and uncouples					10.23	926.75	
80	76	OGRE	OGRE3 pulls west through WGL4 switch onto WGL2, runs to tail track					10.23	936.98	
81	77	OGRE	OGRE3 shoves COM1A-Cut1A west and connects to COM1A-Cut1B					2.84	939.82	
82	78	OGRE	OGRE3 performs initial air test and carmen completes inspection of COM1A-Cut1B					60.00	999.82	
83	79	OGRE	OGRE3 shoves COM1A- Cut 1 on WGL2 through WGL2/1 crossover west of Wake Rd onto Port Lead 1 (L1), connecting to COM1A-Cut2					28.98	1028.80	
84	80	OGRE	OGRE3 hooks Rearend power to COM1A and returns to Support Yard using open track					5.00	1033.80	
85										
86			**Total Activity Time**				1,405.2		1033.80	
87			**Variance in Activity Time: RLBA vs. HDR**				371.4			

Drawing upon RLBA's many years of railroad operating knowledge and experience as a recognized industry leader in rail operating plan development, including the use of the Rail Traffic Controller simulation program[8], RLBA identified areas of disagreement with HDR's assumptions and differences in the steps HDR employed in its simulation. RLBA's railroad operations expert, Ted Johnston, a former Manager of Train Operations for Union Pacific Railroad, working under the direction of Stephen Sullivan, reviewed the HDR simulation and developed a head-to-head comparison of the unloading process for one, 104-car loaded coal train. Referring to Figure 5 above, the head-to-head comparison of the 104-car coal train appears as COM1A in the simulation. Specifically, HDR left out 15 key activities which are highlighted in yellow in Figure 5 in the process of train movements during the unloading operations at OBOT. HDR also failed to properly assign some tasks to the different entities involved in this operation.

Using RLBA's methodology, it was determined the unloading process for one, 104-car loaded coal train will take 1,405.2 minutes, or 23.4 hours, compared with HDR's 1,033.8 minutes (17.23 hours), a difference of 371.4 minutes or 6.17 hours.

The beginning of the Simulation states COM1A arrives at the W. Lead of the Support Yard at midnight. Using RLBA's understanding of the facility, trains arriving on the W. Lead would have to traverse through Union Pacific's Oakland Intermodal facility if they arrived via Niles Subdivision through Oakland's Jack London Square. Only one track in this facility provides access to the support yard and that track must remain clear in order for these trains to arrive without further delay. HDR did not assign any time to this situation, however RLBA believes it would take 27.6 minutes for the train to clear the main track and traverse the intermodal facility before arriving at the support yard as shown in Reference Line Number 1 of Figure 5 (RLN 1, Figure 5).

Upon arriving at the OAB Rail support yard, the Union Pacific crew would have to put the train into two tracks due to its length, a move referred to as a 'double over' in railroad terminology.

[8] Rail Traffic Controller (RTC), simulation software is used in STB cases and proceedings

RLBA believes the double over process will take 42.64 minutes and ends with "Secure COM1A-Cut 1 in SY6," (RLN 7, Figure 5). The HDR simulation then assumed the OGRE switch crew would remove the inbound locomotives from the train and store them in the support yard. RLBA's experts disagree with this assumption since Union Pacific has a locomotive servicing facility adjacent to the support yard. Union Pacific's practice is to have all the locomotives brought to the servicing facility upon their removal from an inbound train as they have all the equipment necessary to safely service the locomotives in that area, consistent with best operating practices including consciousness of environmental concerns.

After the Union Pacific crew removes the locomotives and returns them to their facility, the OGRE crew, using OGRE switching equipment, will begin the process of moving the loaded coal cars out of the support yard to the OBOT facility. When the Union Pacific crew splits the train between the two support yard tracks, RLBA assumes they will do so evenly, leaving 52 cars in each track. The OGRE crew will pull the first cut of 52 cars back to the dumping facility, breaking it into 26 car cuts for unloading. RLBA believes it will take 53.61 minutes (RLN 13-18, Figure 5) to complete this first move where HDR only allocated 46.73 minutes. The crew will then return to the support yard for the second cut of 52 cars and pull them back into OBOT, breaking them into two 26 car cuts like the previous 52 cars. Based on the HDR simulation, at this point the OGRE crews shift is complete. As a result, the cars will remain in this location until the OGRE first shift crew comes on duty at 06:30 AM; 390 minutes after the simulation began.

Upon coming on duty, HDR allocates 30 minutes for the OGRE crew to prepare for the day at the W. Burma Road Locomotive Track. RLBA does not dispute this assumption. However, HDR assumes the crew immediately begins unloading coal cars at this point. They do not provide any time to move the locomotive from the Locomotive Track to the tracks where the cars are currently located. RLBA determined it would take 14.77 minutes (RLN 30, Figure 5) for the crew to move the locomotive off the storage track and on to the first cut of 26 cars to begin dumping coal.

As the crew begins the dumping process, HDR assumes each rail car will take 1.5 minutes to unload using rapid discharge hoppers with remote control pneumatic doors. At the time of this report, there are currently no operations which use this type of car and the technology has not been proven. One railcar manufacturer that has built a prototype railcar with an 'automatic bottom discharge system' has indicated to RLBA that this type of car is prone to unloading issues preventing all the coal from completely unloading. Because the technology is unproven, RLBA is assuming an unloading time of four minutes per car. Included in this assumption is the process of spotting a car to be dumped, engaging the rapid discharge shoe, activating the shoe, dumping the car, closing the dumping doors and restoring the rapid discharge shoe. With this assumption, RLBA believes it will take 104 minutes to dump 26 cars, where HDR assumed 39 minutes as shown in RLN 31 of Figure 5. This process is repeated three more times (RLN 36, 40 & 45, Figure 5) to unload all four cuts of 26 cars. This equates to 416 minutes (6.93 hours) of actual unloading time. That does not include other functions which must occur during this process which include switching unloaded cars to other tracks to facilitate the unloading of more cars, securing unloaded cars to be left unattended and coupling into the next cut of cars to be unloaded. With those activities included (RLN 29-33, 35-37, 39-43, Figure 5) RLBA's complete unloading time is 483.82 minutes (8.06 hours).

The HDR simulation indicates the unloading portion alone will only take 156 minutes (2.6 hours) and the whole process will take 330 minutes (5.5 hours). Relying on its operational knowledge, RLBA does not believe this to be a realistic time frame to complete the unloading process. Not only is the operating time unrealistic in view of the absence of any use of the equipment type HDR proposes but the proposed operation suggests OGRE will be taking major safety shortcuts which could put employees at risk for personal injury or lead to an incident such as a derailment.

After all cars have been dumped the cars must be coupled back together in cuts of 52 cars to be put back in the support yard tracks. Based on RLBA's understanding of Union Pacific's operations with its unit train partners, OGRE will be expected to perform an Initial Terminal

(Class I) Air Test on all cars before the train can be interchanged back to Union Pacific. For 52 cars, a Class I air test will take 104 minutes assuming two minutes per car being walked by a carman (RLN 45, Figure 5). OGRE will perform this inspection in the OBOT facility on the first cut of cars and then return them to the support yard. They will then return to OBOT and couple the remaining 52 cars together and perform the Class I air test on those cars, again taking 104 minutes to complete (RLN 50, Figure 5). After completing the air test, the OGRE crew will deliver the remaining 52 cars to the OAB Rail support yard and then will notify Union Pacific the air test is complete and the cars are ready to be interchanged back to Union Pacific.

After being notified by OGRE that the air test has been completed and the train has been placed back in the support yard, the local Union Pacific Yardmaster will direct his switch crew to retrieve locomotives from the adjacent Union Pacific locomotive service track and begin the process of building the outbound train. Union Pacific also will call a mainline road crew to be on duty two hours from the time they receive notification the train has been interchanged back to them. Two hours is the standard call time for Union Pacific train crews (RLN 57, Figure 5) based on their collective bargaining agreements and Union Pacific management will not allow a crew to be called for a train for which there is an *anticipated* release time back to them. Union Pacific's standard practice requires notification the train is *actually* released before calling a crew. During this two hour time frame, the Union Pacific switch crew will place the distributed power unit (DPU) on the rear of the track that will be designated as the rear of the train and the remaining units on the front end of the track which has been designated as the front of the train. They will then couple the two cuts of cars together and have a mechanical foreman link the DPU to the head end consist. It will take the switch crew 84.73 minutes (RLN 58-63, Figure 5) to build the train and have it ready to depart for the outbound crew when they come on duty 35.27 minutes (RLN 65) later.

This assumes a best case scenario. There are a number of factors in the normal operations of a railroad which can disrupt the normal flow of train traffic. These disruptions can lead to increased cycle times and other inefficiencies. Examples of the types of disruptions normally faced by railroads include but are not limited to: derailments, personal injuries, grade crossing accidents, track maintenance, crew availability, locomotive failures and railcar failures.

Derailments are of particular concern in this type of operation. Human factor derailments in switching operations due to improperly lined switches were the leading cause of derailments in 2016 according to data available from the Federal Railroad Administration[9]. The amount of switching HDR has suggested in their simulation suggests the opportunity for a switch involved derailment is a significant risk. In the event of a derailment, it is also possible a railcar could tip over and spill the coal contained within. This type of event would lead to increased time in the facility before a train would be able to depart.

IV. Fugitive Coal Dust in Coal Train Operations

RLBA understands that OBOT plans to use rapid discharge coal hoppers with custom Ecofab[10] railcar covers to eliminate coal dust in its transportation of coal trains through the City of Oakland, to the Port, to include the operation of unloading, or dumping of each rail car in the OBOT facility. Conceptually, OBOT would purchase or lease rapid discharge coal cars, of which, there are several types from various rail car manufacturers. Then, OBOT would have the Ecofab covers custom designed and fitted to the fleet of rapid discharge cars. Rapid discharge cars are loaded from the open top of the car and emptied from the bottom of the car through moveable doors. The proposed plan would look something like this: the Ecofab covers would be placed, fitted, and secured to each car once the entire coal train, of 104 cars, was loaded at the origin point in Utah. The covers would remain on the train through the entire process of transportation to Oakland, onto OAB Rail, through the OBOT dumping facility, and then returning to Utah as empty cars at which point the covers would be removed and stacked so that each car could be loaded again, with the whole process repeating itself.

[9]http://safetydata.fra.dot.gov/OfficeofSafety/publicsite/Query/inccaus.aspx
[10] "Covered Rail Cars" at Terminal Logistics Solutions website, tlsoakland.com/design, accessed 10-5-17.

While numerous methods that include water sprays, topical surfactants, and profile shaping are employed in the rail industry to control and mitigate coal dust in train operations, the application of covers to coal-carrying cars is not one of the methods in use. In fact, there has been no testing, no study data, nor proof of concept conducted to determine the effectiveness and feasibility of covering rail cars that transport coal.

BNSF Railway, one of the premier railroads in North America, has a conducted extensive research into the areas of fugitive coal dust mitigation related to railroad operations. In fact BNSF is a leader in this type of research, conducting numerous tests and modeling into the various methods mentioned at the beginning of the preceding paragraph, in order to measure and control the release of fugitive coal dust during railroad operations. During one of its presentations before the Rail Energy Transportation Advisory Committee (RETAC) of the Surface Transportation Board (STB), in response to a question asked by a committee member, BNSF indicated that fugitive coal dust is released from the top of coal cars and from the bottom of coal cars, with seven percent of the total release occurring from the bottom of the car.[11] BNSF has described fugitive coal dust release during rail transportation to be as much as three percent of the total loaded coal volume per car.[12]

Previously in this report, RLBA described the two routes by which UP would move coal trains from the Savage Terminal in Utah to Oakland and into OAB Rail. Using assumptions based on the BNSF citations above and using the HDR simulation coal train length of 104 cars, and also using the loaded coal weights of 115 tons and 130 tons for each rapid discharge coal car[13], trains moving between Utah and OAB Rail could disperse between 50,232 lbs./train and 56,784 lbs./train of fugitive coal dust through the bottom of each train's coal cars, during each trip.

Two factors influence how much fugitive coal dust escapes from the loaded rail car and when higher amounts of release occur. Higher amounts of release occur during "start and stop"

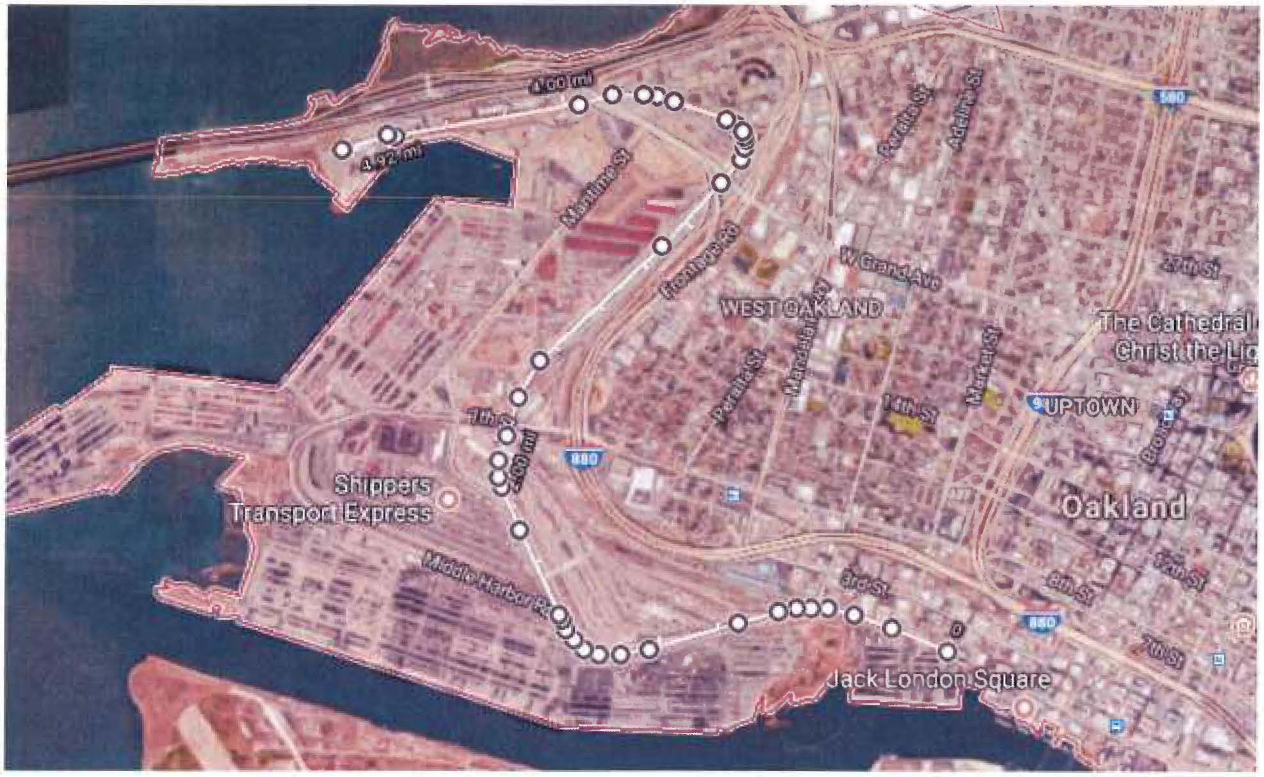
[11] Meeting Minutes, Rail Energy Transportation Advisory Committee (RETAC) convened at the Surface Transportation Board (STB) offices in Washington, D.C., on Thursday, September 10, 2009.
[12] BNSF - Customers - What I Can Ship - Coal - Coal Dust FAQs: March 2, 2011
[13] OBOT has yet to specify a type of rapid discharge car which range in capacity from 115 to 130 tons of coal/car

motions of loaded cars, commonly referred to as "switching and spotting" of one or more cars. This type of motion jostles or shakes the car causing the fine particulate coal matter, which has the consistency of talc powder, to fall to the bottom of the car and escape through seams, plates, and door enclosures in the bottom of the car. Dust can also be released in standing cars and during regular train movements but to lesser degrees than during switching and spotting operations.

The second condition that affects the amount and rate at which coal dust is released is the distance traveled by the loaded coal train. As a train travels, motion and vibration occurs to all the cars in the train. As a result, the loaded coal in each car compresses, grinds, and pulverizes, creating additional fine powdered coal which settles to the bottom of the car and eventually escapes as fugitive coal dust. In this case the UP loaded coal trains will travel over 1000 miles in a two day trip to reach the support yard at OAB Rail. Over the southern route via Stockton, trains will travel 1050 miles, 368 of which will be in California, and 14 miles proper through the City of Oakland, including approximately ½ mile along and through Embarcadero Street. Figure 6, below was prepared by RLBA to illustrate how a coal train would travel through Oakland to the OBOT facility, using the southern UP route through Stockton.

Figure 6

Southern Coal Train Route through Oakland



Following the southern UP route, which assumes the train comes through Jack London Square, it is a total of 4.85 rail miles from where the train leaves the mainline to the end of track in the OBOT facility. Each car will travel an initial 2.7 miles from the time it clears the mainline to the time it reaches the approximate center of the new OAB Support Yard. After the train is split into two cuts of 52 they will then be taken back to the dumper. Not every car will go to the end of track location, but every car will go through the dumper, which is located approximately 4.4 rail miles from where the train enters the OAB Rail. Therefore every car will travel an additional 1.7 miles from the dumper back to the support yard prior to departure. A similar analysis would apply were the coal to be transported via the northern rail route to the OBOT facility.

Considering all of the aforementioned conditions, it is logical to conclude that a significant amount of fugitive coal dust will be released during the back end of the coal train operation, specifically during the switching operation on OAB Rail, as identified in the RLBA comparative head-to-head analysis of the HDR simulation, when the coal cars are moved between the support yard to, and through, the OBOT car dumper and then back to the support yard.

Using the HDR simulation, each 104-car unit coal train would arrive at OBOT from the support yard over OAB Rail in two 52-car cuts or blocks of cars, and then further divided into four 26-car cuts for unloading at the OBOT dumping facility. In terms of how many start and stop moves each loaded car would experience: 1st car, one start and stop motion, 2nd car, two start and stop motions, 3rd car, three start and stop motions, etc., etc., ...with the last car in the cut experiencing 26 start and stop motions until it is unloaded. This process would be repeated until all four cuts of 26 cars are unloaded and then combined in two 52-car blocks of empty cars for return to the OAB Rail support yard.

Again using the HDR simulation, each 104 car coal train will be divided into 52-car blocks on two tracks in the OAB Rail support yard, with the first 52-car block experiencing six start and stop switching moves in order to position the cars at the OBOT facility, ready for dumping. The second 52-car block will experience five starts and stop switching moves to position its cars, ready for dumping. Once dumping is completed on 104 cars, 52 empty cars will experience six start and stop moves for return to the OAB Rail support yard, and 52 empty cars will experience five start and stop moves for return to the support yard.

DOCUMENTS CONSIDERED

All of the documents relied by me in the preparation of this report are noted in appropriate locations in the text of the report and/or footnotes. Additional documents that I have considered are listed below.

HDR, Basis of Design, Oakland Bulk and Oversized Terminal, Preliminary Engineering, Prepared for California Capital Investment Group – All Sections

Oakland Army Base Rail Master Plan Report; prepared for CCIG Oakland Global, LLC; prepared by HDR Engineering, Inc. 2/7/2012

Report on the Health and/or Safety Impacts Associated With the Transport, Storage, and/or Handling of Coal and/or Coke in Oakland, Including at the Proposed Oakland Bulk and Oversized Terminal in the West Gateway Area of the Former Oakland Army Base; Prepared for City of Oakland June 23, 2016; Prepared by ESA

Oakland Bulk and Oversized Terminal Air Quality & Human Health and Safety Assessment of Potential Coal Dust Emissions; Prepared for California Capital and Investment Group; Prepared by HDR Engineering, September 2015 OAK0006754-OAK0006799

Bowie Presentation to UPRR Circulated to CCIG - OB057454

Email Enclosing Bowie Presentation to UPRR OB057453

239102 Application for common carrier by exemption

OGRE STB Verified Notice of Exemption - OB054332

Port Petition for Housekeeping Stay re OGRE - OB020520

OBOT Presentation to UP on Rail Ops - OB057454

OBOT v. Oakland - Complaint - N.D. Cal. 16-cv-07014

HDR Preliminary Simulation for CCIG re OBOT

Union Pacific Salt Lake City Area Timetable #5, Effective 0900C Monday, December 7,2015

Union Pacific Roseville Area Timetable #6, Effective 0900 Monday, October 22,2012

Letters to the City of Oakland from OBOT/CCIG (OAK054816), TLS (OAK054817); and CCIG. (OAK055098)

Email from Stotka to Peterson and McClure re OGRE Filing 0B053921

STB Decision Granting OGRE Motion to Withdraw its NOE - OB020127

Map – OGRE Rail - OAK0208333

TLS letter - OAK0089479

TLS Preliminary Operating Plan (Aug. 3, 2015) - OAK0309

Oakland Bulk and Oversize Terminal TLS Basis of Design Appendix - OAK054819

Oakland Bulk and Oversize Terminal TLS Basis of Design Volume One - OAK054820

HDR Engineering (including Jensen Hughes white paper) - OAK0006754

Golder Peer Review of HDR Report - OAK1905

Cardno Peer Review Report - Preliminary Engineering - OBOT 075973

OBOT letter - OAK0059870

Zoe Chafe Report - OAK0034673

Comparison of ESA, Chafe Report, and Public Health Panel's Finding - OAK0007876

Oakland Global - OAK0004175

OAK059404 (ESA Report in Color) 29

Steve Sullivan
Managing Director

Education
BA, Economics, College of William and Mary, 1977

Professional Development and Certifications
Corporate Finance, the Wharton School, University of Pennsylvania
Executive Management, Penn State University
Project Management, Drexel University
Modal Analysis, University of Texas – Texas Research Development Foundation

Years of Transportation Experience
38

Qualifications
Prior to joining RLBA in 2013, Mr. Sullivan served for thirteen years as Vice President and Executive Director of the American Short Line & Regional Railroad Association (ASLRRA), a trade association comprised of 950 private and public sector railroad companies and their suppliers headquartered in Washington, DC. Mr. Sullivan directed initiatives and staff strategic alliances, financial management, administration, industrial safety and security, technology development/deployment, training, legislative and regulatory matters. Mr. Sullivan also developed new business processes, including technical process integrations that increased revenues and membership six to eight percent annually. In addition, Mr. Sullivan spearheaded railroad security/anti-terrorism challenges with Federal agencies at all levels, developing and implementing a comprehensive post-911 security plan re the industry's 550 railroads, directed, from concept to application, the design and deployment of a first-of-its-kind railroad risk mitigation process/model, and guidelines that apply generally and specifically to the safe transportation of crude by rail (CBR). For his efforts, he has received commendations and letters of appreciation from The White House, the Department of Transportation, the United States Coast Guard and the Department of Defense.

Relevant Project Experience

- ***FirstEnergy Generation, LLC*** Provided an expert opinion on railroad operations and more specifically, the rerouting and detour routing of railroad trains resulting from weather-related conditions in a "force majeure" dispute between FirstEnergy and two class I railroads. Through deposition and arbitration testimony over a six-month period, helped client save tens of millions of dollars in liquidated damages.

- ***Kansas City Southern*** Analyzed the operational impacts to Kansas City Southern (KCS) that might result from the potential introduction of BNSF direct service into a jointly-owned (KCS and UP) and operated segment of railroad, known as the Rosebluff Lead, in the greater Lake Charles, LA area, particularly as it concerned the movement of crude-by-rail into the CITGO Lake Charles Manufacturing Complex. Prepared a Verified Statement submitted to the Surface Transportation Board describing the significant negative impacts on the safety and fluidity of existing operations that would flow from granting BNSF's Terminal Trackage Rights.

- ***Mahoney, Silverman & Cross, LLC*** Provided litigation support relating to Mahoney, Silverman & Cross, LLC (MSC's) client's interest in reactivating a private at-grade railroad crossing a BNSF Railway (BNSF) right-of-way south of Lorenzo, Illinois. MSC sought RLBA's expertise due to the fact that MSC's client's farm land is bisected by a BNSF mainline commonly referred to as the "Transcon", which is amongst the busiest and most essential routes over which BNSF operates, resulting in very aggressive legal tactics enacted by BNSF. Mr. Sullivan conducted on-site right-of-way, operational safety analyses and grade crossing research as necessary as well as providing the affirmative testimony and deposition of an experienced RLBA operations expert.

- ***Total Petrochemical Inc.*** Provided expert litigation assistance supporting the company's stand-alone rate case against CSX Transportation. Mr. Sullivan assisted in the evaluation and construction of methodologies rebutting CSX's reply evidence pertaining to yard dwell times and drafted text presented to the Surface Transportation Board discussing various assumptions made by CSX to increase dwell times artificially and thus, associated cost, on a hypothetical stand-alone Total Petrochemical Railway.

- ***Howard Energy Partners*** Designed program and processes for a compliance audit of federal regulations from multiple agencies affecting the rail operations of a large Texas-based oil and gas client engaged in the loading and handling of crude oil in unit tank car trains. Assisted other RLBA personnel during an on-site audit designed to assess and evaluate the application of the regulations.

- ***Foulston Siefkin LLP*** Determined the feasibility of constructing a permanent grade crossing over Wichita Terminal Association (WTA) tracks to allow the commercial development of the client's 'landlocked' property. Mr. Sullivan authored a Verified Statement submitted before the Surface Transportation Board commenting on the minimal impact of the grade crossing on WTA's interchange operations with BNSF Railway. Drawing upon observations during the inspection and a review of WTA's records, Mr. Sullivan determined that with minor alterations, rail service could continue with minimal negative effect to railroad operations or safety.

- ***Sierra Club*** Evaluated the U.S. Department of Transportation's (DOT) proposed rule addressing crude and ethanol rail tank car safety and provided analysis in the form of a report that was submitted as part of the public comments of the Sierra Club and its coalition partners. Prepared a written report addressing the ability of the proposed tank car safety measures to mitigate safety risks to public health, safety, and the environment, while identifying specific measures that would improve tank car standards to reduce the risk of accidents.

- ***King County, Washington*** Provided legal and technical assessment of railroad right-of-way and railway engineering standards related to rail-banked property corridors held under the federal Rails to Trails Act. Provided expert testimony on the engineering and operational requirements of modern passenger and freight railroad including air and ground rights/needs. With Mr. Sullivan's strong testimony as a base, King County prevailed in its defense of its rights of ownership of railroad property corridors.

Over the course of his career, Mr. Sullivan developed working relationships with Class I railroads, short lines, Amtrak, commuter railroads, state, local and federal government agencies as well as suppliers. He prepared position papers and testimony on behalf of Class II and Class III railroads and testified before Congress on railroad infrastructure and capital investment. Since joining RLBA in 2013, he has utilized his extensive railroad operations knowledge and experience on a variety of simulation, ligation support and strategic planning projects. Other initiatives include working with industry leaders to develop a CBR risk mitigation seminar (in planning) and continued analysis on the changing regulations affecting the shipment of crude oil in tank cars.

Stephen M. Sullivan

Court Cases

- US District Court for the Northern District of New York
  Delaware & Hudson Rwy. And Canadian Pacific Rwy. vs OMYA Corporation
  Case No. 1:12-cv-01691 2013-2014

- 12th Judicial Circuit, Joliet, Will County, IL
  BNSF Rwy., Co. vs David F. Grohne
  Case No. 14 EDS 0065 2014

- Circuit Court of Caroline County, MD
  U.L. Harmon vs Heirs of William Hall
  Case CA 05-C14-017158AJ 2014 – 2015

- US District Court for the Western District of Washington State
  Tracy and Barbara Neighbors, et.al. vs King County
  Case 2:15-CV00970 2015

- American Arbitration Association, New York, NY
  First Energy Generation, LLC., vs CSX Transportation & BNSF Rwy., Co.
  Case No. 01-15-0004-4830 2016
  BNSF Rwy., Co. & CSX Transportation vs First Energy Generation, LLC.
  Case No. 01-15-0004-4831 2016

- District Court, Harris County, Texas, 269th Judicial District
  EOG Resources Inc., vs CIT Rail, LLC.
  Case No. 2015-54966 2017

Publications

- Railroading in a Post-9/11 World, Railway Age October 1, 2011

- 2-mile trains trending - Class I railroads seek to maximize operating performance with longer trains, Trains Magazine June, 2016, contributing

Ted Johnston
Principal Consultant

Education
University of Oklahoma, Price College of Business, Norman, OK
Bachelor of Business Administration in Supply Chain Management, August 2007 – May 2011 (Integrated Business Core Alum)

Years of Transportation Experience
6

Qualifications
Mr. Johnston joined RLBA in 2017 after spending 6 years in transportation operations at Union Pacific Railroad. He brings a strong background in rail operations, having served in various front line management positions at UP. He plans to provide expert analysis of railroad operations to assist passenger and freight railroads as well as shippers streamline their operations, utilizing Rail Traffic Controller (RTC) rail simulation software as appropriate.

RLBA Project Experience

- ***Howard Energy Partners*** RLBA was contracted to assess compliance with federal regulations at GT Logistics (GTL) and affiliated rail operations at its Port Arthur, TX terminal on behalf of parent company, Howard Energy Partners (HEP). Mr. Johnston conducted an on-site review of all documentation to ensure its compliance with FRA, PHMSA, TSA and OSHA regulations where applicable as well as determining if GTL filing with the STB as a railroad would be beneficial. During the on-site review, RLBA interviewed key members of HEP and GTL management to gain an understanding of the operations occurring at the facility and the team's knowledge of rail operations. He also audited the compliance of plans submitted to the FRA and advised on deficiencies in those plans.

Prior Relevant Experience

- ***Parsons Sub Variability Reduction*** As Manager of Train Operations in Coffeyville, KS, in conjunction with members of the operating and mechanical teams, worked to reduce break-in-two's and train separations on UP's Parsons Sub, a subdivision consisting of undulating territory hosting mostly loaded unit trains of coal, grain and sand. Identified train sets belonging to one customer with internal flaws in couplers, which led to numerous train separations. Revised train handling techniques to reduce chances of break-in-two's by involving train, engine and yard (TE&Y) employees with "best practice" train handling abilities. Subdivision experienced velocity increase from 27 to 30 MPH due to overall reduction in variability incidents.

- ***Enid Sub Grade Crossing Safety*** As Manager of Yard Operations in Enid, OK, due to increased drilling for oil and gas along UP's Enid Subdivision, worked with numerous local agencies to increase enforcement of local grade crossing laws as part of Union Pacific's Public Safety Team. Became certified to present grade crossing safety materials to local trucking companies and made over 150 presentations in 2014. Achieved the lowest number of grade crossing incidents on the Enid Subdivision that year. Also worked with UP's Manager of Public Projects to identify grade crossings to be closed or upgraded in anticipation of receiving funding from the State of Oklahoma.

- ***Coffeyville Terminal Dwell*** As Manager of Train Operations in Coffeyville, KS, analyzed operations at the Coffeyville, OK crew change point to determine the main factors creating bottlenecks there and implemented changes which led to a 34% reduction in terminal area dwell time per train. Organized a cross-functional team comprised of representatives of train, engine and yard employees (TE&Y), engineering, mechanical, dispatching and labor relations to develop best practices and increase throughput.

- ***UP/SKOL Manifest Interchange*** As Manager of Train Operations in Coffeyville, KS, worked with UP's finance and short line groups to analyze the feasibility of moving the interchange with SKOL from Coffeyville, KS to Neodesha, KS. Looked at having SKOL deliver a manifest train to UP three days/week to send to Neff Yard in Kansas City to be humped, which would have eliminated the need to pull interchange at Coffeyville and flat switch cars, thus reducing job costs and switching costs.

- ***Oklahoma City Auto Facility - AOK Railroad*** As Manager of Yard Operations in Enid, OK, worked with a cross functional team comprised of UP staff from, marketing and sales, operations, short line marketing and locomotive management departments to improve the process of serving the Oklahoma City auto facility on the AOK Railroad. Previously, unit auto trains were brought into UP's Oklahoma City yard, the power was removed and the balance of the train was pulled to the auto facility in two or three separate cuts by the AOK. The process was then reversed and repeated once the cars were unloaded. Mr. Johnston developed and implemented an improved new process wherein the train was run through Oklahoma City yard and delivered to the AOK which then returned the empty train to UP, improving service and cutting costs.

- ***Disciplinary Hearings*** Served as charging and hearing officer in numerous industrial hearings related to employee disciplinary matters. Testified dozens of times on the record on behalf of the carrier as both a charging officer and company witness. In the role of charging officer, was responsible for conducting investigations into employee violations of company policies, operating rules and federal regulations. Upon completion of investigations, was responsible for notifying employees within time limits of the aspect of the Collective Bargaining Agreement (CBA) of which was in violation and that a formal hearing would be conducted and evidence presented to determine the facts of the investigation and if discipline would be assessed based on the outcome of the investigation. In the role of hearing officer, held investigations on behalf of the company and in accordance with the employee's CBA in a fair and impartial manner. Qualified to hold hearings related to employee dismissals.

Mr. Johnston completed Union Pacific's Operations Management Training Program in 2012 and served as Manager of Yard Operations (Assistant Trainmaster) in Van Buren, AR and Enid, OK. Prior to joining RLBA, Mr. Johnston served as Manager of Train Operations (Trainmaster) in Coffeyville, KS where he was responsible for 250 miles of territory on one of Union Pacific's busiest freight corridors. In 2016, Mr. Johnston was part of a team which achieved the highest numbers in safety, service and value on the entire UP system. Mr. Johnston has worked with numerous customers in business development, service planning and facility safety. He also worked with short line carriers to analyze opportunities to benefit both customers and the UP. Mr. Johnston also gained experience working with local governments regarding grade crossing safety and public safety around railroad operations.

STATEMENT OF COMPENSATION

My compensation for expert witness services and time spent at deposition and trial to the Defendant for this case is $350.00 per hour.