

**CREATE – TECHNICAL MEMORANDUM**  
**B9/EW1 PROJECT**

**TO:** Samuel Tuck III, IDOT  
**FROM:** Jarrod Cebulski, Patrick Engineering Inc.  
**DATE:** October 21, 2014  
**RE:** CREATE Program B9/EW1 ECAD Technical Memorandum  
Design Change in Area of EW1

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The purpose of this technical memorandum is to document an updated environmental review due to recent changes in the project design in the EW1 portion of the project proposed by Baltimore and Ohio Chicago Terminal (B&OCT) / CSX Transportation (CSX). The previously approved environmental analysis documents for the B9/EW1 Project consist of the following:

- Environmental Class of Action Determination (ECAD) document dated July 2010: Prepared by Hanson Professional Services, Inc. (Hanson) to analyze the potential impacts of the B9/EW1 project.
- ECAD Tech Memo dated January 2013: Prepared by Patrick Engineering Inc. (Patrick) to analyze the potential impacts for a proposed extension of the B9/EW1 project limits.
- ECAD Tech Memo dated June 2014: Prepared by Patrick to analyze potential impacts associated with a design change proposed for a recommended noise wall located in the B9 portion of the project.

During the Phase II (final) design, CSX modified the design of the connections to the CSX Intermodal Leads, requiring track work outside of the previous Environmental Survey Request (ESR) limits and relocated cantilever signals at approximate Station 632+50 (BRC Main No. 4), Station 669+80 (BRC Main No. 4), Station 753+50 (BRC Main No. 4), and Station 762+20 (BRC Main No. 4). The proposed design modifications contemplated by CSX are located in the existing right-of-way in the EW1 portion of the project, and no design changes are contemplated in the B9 portion of the project. See Appendix A for location map showing the study area. The study area evaluated and documented in this Tech Memo is shown as “B9/EW1 Addendum G Project Area”. The study area can be seen in more detail in the ESRF Addendum G Exhibit found in Appendix B. Additionally, the year of greatest construction activity was revised from 2013 to 2016. These are the extent of the changes that are being evaluated in this memorandum.

An addendum to the project’s previous ESR was prepared to include the additional project footprint and evaluate potential changes to the previously approved environmental analysis

documents. The air quality report was also revised to reflect the current proposed year of greatest construction activity. An update to the B9/EW1 Preliminary Environmental Site Assessment (PESA) was performed for the areas outside of the original environmental survey boundaries.

#### **B9/EW1 ESRF Addenda A thru F**

Documentation of the environmental analysis for each of the ECAD environmental categories related to Addenda A thru F is documented in the project ECAD dated July 2010 prepared by Hanson, ECAD Tech Memo dated January 2013 prepared by Patrick, and ECAD Tech Memo dated June 2014 prepared by Patrick.

#### **B9/EW1 ESRF Addendum G**

This addendum was for review of biological and cultural clearance for property within the CSX Intermodal facility that was previously outside of the project's footprint but will now be impacted as a result of the design modification to the track work for the CSX Intermodal Leads. This addendum was submitted to IDOT on July 11, 2014. See Appendix B for ESR Addendum G which depicts the boundary of the area.

**Patrick analyzed the environmental resources for potential impacts resulting from the implementation of the revised EW1 project footprint. The following is a summary of Patrick's analysis to supplement the approved ECAD (dated July 2010) analysis, approved ECAD Technical Memorandum (dated January 28, 2013), and approved ECAD Technical Memorandum (dated June 30, 2014).**

- I. Social/Economic:** The proposed project work evaluated in this ECAD Tech Memo would not affect the analysis or conclusion of the socioeconomic resources as documented in the July 2010 ECAD or the January 2013 and June 2014 ECAD Tech Memos for: I.1-Relocations, I.2-Changes in Travel Patterns, I.3-Economic Impacts, I.4-Changes in Land Use & Economic Development, I.5-Community Cohesion, I.6-Public Facilities and Services, I.7-Title VI and Other Protected Groups, I.8-Environmental Justice, and I.9-Bicycle and Pedestrian Facilities.
- II. Agricultural:** The proposed project work evaluated in this ECAD Tech Memo would not affect the analysis or conclusion of the agricultural resources as documented in the July 2010 ECAD or the January 2013 and June 2014 ECAD Tech Memos.
- III. Cultural:** The cultural resource clearance for ESR Addendum G was received from IDOT's Cultural Resource Unit on August 4, 2014. See Appendix C for the cultural clearance documentation.

Based on the cultural clearance received, the proposed project work evaluated in this ECAD Tech Memo would not affect the analysis or conclusion of the cultural resources as documented in the July 2010 ECAD or the January 2013 and June 2014 ECAD Tech

Memos for: III.1-Archaeological Sites, III.2-Historic Bridges, and III.3-Historic Districts and Buildings.

**IV. Air Quality:** The proposed project work evaluated in this ECAD Tech Memo would not change the analysis or conclusion of the air quality resources as documented in the July 2010 ECAD or the January 2013 and June 2014 ECAD Tech Memos for the design year general conformity emissions analysis (part of Section IV.1-Attainment/Nonattainment), the microscale analysis (Section IV.2), and the construction-related particulate matter analysis (Section IV.3).

The year of greatest construction activity has been updated from 2013 to 2016. This requires an update to the general conformity analysis for construction year emissions (part of Section IV.1-Attainment/Nonattainment). A summary of the updated analysis for air quality for the revised year of greatest construction emissions is described as follows with supporting detailed calculations in Appendix D:

IV.1-Attainment/Nonattainment (Construction Year Emissions)

The General Conformity analysis performed as part of the January 2013 Tech Memo was revised for this proposed improvement for hydrocarbons (HC), nitrogen oxide (NO<sub>x</sub>), and particulate matter (PM<sub>10</sub> and PM<sub>2.5</sub>). Project related emissions were analyzed for the revised year of the greatest construction emissions, 2016 (previously 2013) per direction from the CREATE Railroad Partners received via email from the Association of American Railroads on July 30, 2014. The project-related emissions for the year of greatest construction activity were then compared to the 100 ton per year per pollutant threshold.

Equipment types with their associated horsepower were cross-referenced to emission factors for diesel construction equipment and diesel railroad maintenance equipment generated from USEPA's "NonRoad2008a" model. The emission factors are based on an average fleet age for the specific year being analyzed. Emission factors for light duty gas trucks (LDGTs) associated with construction emissions were generated from USEPA's "MOVES2010b" model.

In some cases, the equipment's exact horsepower was not included on the emission factor table for that type of equipment. In those cases, the equipment type with closest horsepower was utilized to obtain emission factors. If the equipment's horsepower was not specified, the horsepower and associated emission factor that would most likely produce the worst case scenario for emissions was utilized. In cases where the equipment type was not included in the construction equipment table, emission factors for "other construction equipment" for the specified horsepower was utilized or emission factors from the railroad maintenance

equipment table was utilized. The construction emissions analysis results are presented in Table 1.

**Table 1: General Conformity Analysis for Construction Emissions**

Construction Year Analysis				
	Tons/YR			
	HC	NO <sub>x</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>
Construction Emissions (2016)	3.9870	29.3738	2.4807	2.3994
Threshold	100	100	100	100
Does Construction Year Total Emissions Exceed Threshold?	N	N	N	N

The updated construction year emissions analysis would not change the conclusions for this resource item as documented in the approved January 2013 ECAD Tech Memo (Section IV.1-Attainment/Nonattainment). The analysis demonstrates that the project emissions for Hydrocarbons, NO<sub>x</sub>, PM<sub>10</sub> or PM<sub>2.5</sub> are less than the 100 ton per year per pollutant de minimis threshold. For this reason, this project is not required by the Illinois’ General Conformity regulations to complete a full General Conformity determination.

Prior to January 2013, the CREATE Program did not have established guidelines for the analysis of Mobile Source Air Toxics (MSAT). Therefore, MSAT analysis was not included in the approved July 2010 ECAD or January 2013 ECAD Tech Memo. The MSAT analysis was contained in the June 2014 ECAD Tech Memo, but it has been revised as part of this ECAD Tech Memo. The revised MSAT analysis for the B9/EW1 project can be found below.

IV.4-Mobile Source Air Toxics

The U.S. Environmental Protection Agency (USEPA) regulates MSATs. MSATs are compounds emitted from highway vehicles and non-road equipment (e.g. locomotives and construction vehicles) that have the potential to cause adverse health effects. Since the B9/EW1 Project would improve freight rail operations, this project was classified as a project with low potential MSAT emissions. Since emissions are directly related to fuel usage, the fuel usage for each alternative was compared.

For the Build Alternative, the amount of MSATs emitted would be proportional to the amount of fuel used assuming that other variables (such as travel not associated with the project) are the same for each alternative. The estimated fuel usage for the Build Alternative is approximately 135% more than the No-Build Alternative (see Table 2). This increased fuel usage is the result of an increase in the possible

number of train movements between Hayford Interlocking and CP Argo. Although the Build Alternative will result in less locomotive idling and more consistent train speeds, the increase in track capacity is causing the increase in fuel usage.

**Table 2: Fuel Consumption Data from CTCO Train Model<sup>1</sup>**

Alternative	Fuel Consumption (Gallons) (96 hours)
Existing	10,488
No-Build Alternative (2029)	12,851
CREATE Build Alternative (2029) <sup>2</sup>	30,194

Notes:

<sup>1</sup> The fuel consumption data from the CTCO Train Model is for the CREATE B9/EW1 Project corridor only.

<sup>2</sup> The CREATE Build Alternative evaluates the implementation of the entire CREATE Program.

The additional freight rail activity contemplated as part of the Build Alternative would have the effect of increasing diesel emissions in the vicinity of homes, schools, and businesses located in the project area. Therefore, under the Build Alternative, there would be localized areas where ambient concentrations of MSATs would be higher than under the No-Build Alternative. However, the magnitude of these potential increases cannot be reliably quantified due to incomplete or unavailable information in forecasting project-specific MSAT health impacts. The higher MSAT emissions may potentially be offset to some degree by two factors: 1) the decrease in regional truck traffic due to increased use of rail for inbound and outbound freight; and 2) increased speeds on area highways due to the decrease in truck traffic. The extent to which these factors will offset rail traffic-related emissions increases is not known.

A Technical Memorandum was prepared to develop and analyze MSAT emissions specific to Cook County (see Appendix E). The purpose of the analysis was to supplement the national-level trends presented in the FHWA’s *Interim MSAT Guidance*. The analysis concluded that EPA’s adopted regulations for diesel locomotive engine/exhaust systems and fuels are predicted to result in reductions in activity-based emission rates that more than counteract predicted increases in locomotive activity levels throughout the project area. The anticipated result is a decrease in annual MSAT emissions from locomotives despite those projected activity level increases. Specifically, emissions from locomotives were estimated to be reduced by more than 60 percent from 2010 to 2030.

In sum, the localized level of MSAT emissions for CREATE Program projects—including the B9/EW1 project—could be higher relative to the No-Build condition, but this could be offset due to increases in speeds and reductions in congestion (which are associated with lower MSAT emissions). Also, MSAT emissions will be lower in other locations when traffic shifts away from them. On a regional basis, EPA's vehicle and fuel regulations, coupled with fleet and locomotive turnover as well as locomotive re-builds, will over time cause substantial reductions that, in almost all cases, will cause region-wide MSAT emission levels in the future to be substantially less than today.

### **INCOMPLETE OR UNAVAILABLE INFORMATION FOR PROJECT-SPECIFIC MSAT HEALTH IMPACTS ANALYSIS**

In FHWA's view, information is incomplete or unavailable to credibly predict the project-specific health impacts due to changes in MSAT emissions associated with a project. The outcome of such an assessment, adverse or not, would be influenced more by the uncertainty introduced into the process through assumption and speculation rather than any genuine insight into the actual health impacts directly attributable to MSAT exposure associated with a proposed action.

The USEPA is responsible for protecting the public health and welfare from any known or anticipated effect of an air pollutant. They are the lead authority for administering the Clean Air Act and its amendments and have specific statutory obligations with respect to hazardous air pollutants and MSATs. The USEPA is in the continual process of assessing human health effects, exposures, and risks posed by air pollutants. They maintain the Integrated Risk Information System (IRIS), which is "a compilation of electronic reports on specific substances found in the environment and their potential to cause human health effects" (USEPA, <http://www.epa.gov/iris/>). Each report contains assessments of non-cancerous and cancerous effects for individual compounds and quantitative estimates of risk levels from lifetime oral and inhalation exposures with uncertainty spanning perhaps an order of magnitude.

Other organizations are also active in the research and analyses of the human health effects of MSATs, including the Health Effects Institute (HEI). Two HEI studies are summarized in Appendix D of FHWA's Interim Guidance Update on Mobile source Air Toxic Analysis in NEPA Documents. Among the adverse health effects linked to MSAT compounds at high exposures are; cancer in humans in occupational settings; cancer in animals; and irritation to the respiratory tract, including the exacerbation of asthma. Less obvious is the adverse human health effects of MSAT compounds at current environmental concentrations (HEI,

<http://pubs.healtheffects.org/view.php?id=282>) or in the future as vehicle emissions substantially decrease (HEI, <http://pubs.healtheffects.org/view.php?id=306>).

The methodologies for forecasting health impacts include emissions modeling; dispersion modeling; exposure modeling; and then final determination of health impacts - each step in the process building on the model predictions obtained in the previous step. All are encumbered by technical shortcomings or uncertain science that prevents a more complete differentiation of the MSAT health impacts among a set of project alternatives. These difficulties are magnified for lifetime (i.e., 70-year) assessments, particularly because unsupportable assumptions would have to be made regarding changes in travel patterns and vehicle technology (which affects emissions rates) over that timeframe, since such information is unavailable.

It is particularly difficult to reliably forecast 70-year lifetime MSAT concentrations and exposure near roadways and other transportation facilities; to determine the portion of time that people are actually exposed at a specific location; and to establish the extent attributable to a proposed action, especially given that some of the information needed is unavailable.

There are considerable uncertainties associated with the existing estimates of toxicity of the various MSATs, because of factors such as low-dose extrapolation and translation of occupational exposure data to the general population, a concern expressed by HEI (<http://pubs.healtheffects.org/view.php?id=282>). As a result, there is no national consensus on air dose-response values assumed to protect the public health and welfare for MSAT compounds, and in particular for diesel PM. The USEPA (<http://www.epa.gov/risk/basicinformation.htm#g>) and the HEI (<http://pubs.healtheffects.org/getfile.php?u=395>) have not established a basis for quantitative risk assessment of diesel PM in ambient settings.

There is also the lack of a national consensus on an acceptable level of risk. The current context is the process used by the USEPA as provided by the Clean Air Act to determine whether more stringent controls are required in order to provide an ample margin of safety to protect public health or to prevent an adverse environmental effect for industrial sources subject to the maximum achievable control technology standards, such as benzene emissions from refineries. The decision framework is a two-step process. The first step requires USEPA to determine an "acceptable" level of risk due to emissions from a source, which is generally no greater than approximately 100 in a million. Additional factors are considered in the second step, the goal of which is to maximize the number of people with risks less than 1 in a million due to emissions from a source. The results of this statutory two-step process do not guarantee that cancer risks from exposure

to air toxics are less than 1 in a million; in some cases, the residual risk determination could result in maximum individual cancer risks that are as high as approximately 100 in a million. In a June 2008 decision, the U.S. Court of Appeals for the District of Columbia Circuit upheld USEPA's approach to addressing risk in its two step decision framework. Information is incomplete or unavailable to establish that even the largest of highway projects would result in levels of risk greater than deemed acceptable.

Because of the limitations in the methodologies for forecasting health impacts described, any predicted difference in health impacts between alternatives is likely to be much smaller than the uncertainties associated with predicting the impacts. Consequently, the results of such assessments would not be useful to decision makers, who would need to weigh this information against project benefits, such as reducing traffic congestion, accident rates, and fatalities plus improved access for emergency response, that are better suited for quantitative analysis.

**V. Noise & Vibration:** The proposed project work evaluated in this ECAD Tech Memo would not affect the analysis or conclusion of the noise and vibration resources as documented in the July 2010 ECAD or the January 2013 and June 2014 ECAD Tech Memos.

**VI. Energy:** The proposed project work evaluated in this ECAD Tech Memo would not affect the analysis or conclusion of the energy resources as documented in the July 2010 ECAD or the January 2013 and June 2014 ECAD Tech Memos.

**VII. Natural Resources:** ESRF Addendum G was submitted on July 11, 2014 and included the revised proposed project limits. The biological clearance was received for Addendum G on August 04, 2014 and documentation is attached in Appendix C.

Based on the clearance for ESRF Addendum G received, the proposed project work evaluated in this ECAD Tech Memo would not affect the analysis or conclusion of the biological resources as documented in the July 2010 ECAD or the January 2013 and June 2014 ECAD Tech Memos

**VIII. Water Quality/Resources:** The proposed project work evaluated in this ECAD Tech Memo would not affect the analysis and conclusion of water quality or water resources as documented in the July 2010 ECAD or the January 2013 and June 2014 ECAD Tech Memos for: VIII.1-Surface Water Resources/Quality, VIII.2-Permits, and VIII.3-Groundwater Resources/Quality.

**VII. Flood Plains:** The proposed project work evaluated in this ECAD Tech Memo would not affect flood plains; therefore, it would not change the analysis or results documented in the July 2010 ECAD or the January 2013 and June 2014 ECAD Tech Memos for: IX.1-100-Year Flood Plain and IX.2-Regulatory Floodway.

**X. Wetlands:** ESRF addendum G was submitted on July 11, 2014 and included the revised proposed project limits. The National Wetlands Inventory does not show wetlands in the vicinity of the proposed area. A copy of the IDOT email dated August 04, 2014 providing clearance is attached in Appendix C.

Based on the wetland clearance received, the proposed project work evaluated in this ECAD Tech Memo would not affect wetlands; therefore, it does not change the wetland impact analysis or results documented in the previously approved July 2010 ECAD or the January 2013 and June 2014 ECAD Tech Memos.

**XI. Special Waste**

A Preliminary Environmental Site Assessment (PESA) was completed in February 2014 as part of the June 2014 ECAD Tech Memo. The conclusions of the February 2014 PESA were that, within the project limits, three locations contain a number of risk findings. The three locations are (1) track realignment near CP Canal (northwest corner of site), (2) noise walls and siding extension along IHB/B&OCT line, and (3) new mainline tracks between CP Hayford and CP Argo (EW1). The findings at all three location were determined to be “Low Risk” and detailed explanation of each low risk finding was determined is provided in the February 2014 PESA. This assessment revealed that there are no recognized environmental conditions in connection with the Site and, therefore, a Preliminary Site Investigation (PSI) was not required.

As part of the proposed work evaluated in this ECAD tech memo, a Preliminary Environmental Site Assessment (PESA) Addendum was completed for the area of the revised EW1 footprint. The assessment revealed one “Recognized Environmental Condition” (REC) at fueling dispensers and a diesel underground storage tank (UST) within 70 feet and to the south of the proposed track improvements. A PESA Finding of “Moderate Risk” was assigned for a depth stipulation of two feet (proposed for work that includes excavation of more than two feet) because the fuel dispensers are active and there is a potential for soil or water contamination. No staining or dumped materials were observed in the area of the proposed track work. The proposed track work consisting of track removal, realignment, and installation of new track on the existing yard track bed is not expected to require excavation of more than one foot. Therefore, the proposed track work would not be expected to be impacted by the PESA REC Findings.

If excavation will be limited to the upper two feet of soil and include import of base and ballast and if excavated soil is used on site as fill material, no additional environmental investigation or soil sampling is required, unless determined appropriate by the railroads, the CREATE program or regulatory requirements.

If excavated soils require off-site disposal, soil sampling is required to meet the requirements of an off-site disposal facility and in accordance with Illinois Administrative Code (IAC) Title 35 Part 1100 Clean Construction or Demolition Debris (CCDD) Fill Operations and Uncontaminated Soil Fill Operations (if considering soil disposal in an uncontaminated soil disposal facility) or in accordance with a Subtitle D landfill facility. If excavation is planned deeper than two feet, a PSI is recommended.

The relocated cantilever signals at approximate Station 632+50 (BRC Main No. 4), Station 669+80 (BRC Main No. 4), Station 753+50 (BRC Main No. 4), and Station 762+20 (BRC Main No. 4) are within the area evaluated in the B9/EW1 PESA conducted by Patrick Engineering Inc. and dated February 2014. A database search showed that there are no Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) or open leaking underground storage tank (LUST) sites within 500 feet of the limits of construction and that there are no underground storage tank (UST) or Resource Conservation and Recovery Act (RCRA) sites listed in the RCRA Corrective Action Site (CORRACT) list within the limits of construction. The erection of the cantilever signals will not involve buildings or materials containing special waste other than asbestos. Neither the current nor the previous land use type at or directly adjacent to the signal locations include railroad shop maintenance activities, fueling facilities, or high risk land uses. A study of aerial photography in these locations did not reveal any evidence of contaminating uses or contaminated sites/structures. Additionally, the letter received from CSX on May 10, 2013 and included in the February 2014 PESA covered these signal locations and did not note any concerns. Based on this information, no additional evaluation was required at the relocated signal locations as part of this PESA addendum.

**XII. Special Lands:** The proposed project work evaluated in this ECAD Tech Memo would not affect special lands; therefore, it would not change the analysis or results documented in the July 2010 ECAD or the January 2013 and June 2014 ECAD Tech Memos for: XII.1-4(f), XII.2-6(f), and XII.3-Open Space Lands Acquisition and Development (OSLAD) Act lands.

**XIII. Other Issues:** None identified as a result of the proposed project work evaluated in this ECAD Tech Memo.

- XIV. Permits Required:** The proposed project work evaluated in this ECAD Tech Memo would not change the analysis or results documented in the July 2010 ECAD or the January 2013 and June 2014 ECAD Tech Memos.

#### **Environmental Commitments**

The following two environmental commitments included in the original approved ECAD are still in effect:

1. Noise and Vibration – The noise and vibration analysis for this proposed project will need to be reassessed if: a) the project is revised in a manner in which impacts of the project may change due to the project revisions (e.g., a new track alignment is moved closer to a receptor), or b.) the CREATE Program’s train model is updated due to projects being removed of added to the CREATE Program.

The following maintenance procedures will be accomplished by the rail industry to mitigate vibration impacts through minimizing vibration sources: regularly scheduled rail grinding; wheel truing programs; vehicle reconditioning programs; and use of wheel-flat detectors.

2. Permits – Procurement and compliance with all federal, state, and local, permits (NPDES, etc.), required for this proposed improvement, will be the responsibility of the individual railroad(s), or their consultants or contractors, as applicable.

The following three environmental commitments included in the January 2013 ECAD Tech Memo are still in effect:

1. Air Quality – The Belt Railway Company of Chicago will ensure completion of yard improvements including replacement of all Clearing Yard switching engines to effect a reduction in NOx emissions for the build condition. IDOT, in coordination with FHWA, has determined that the replacement of the Clearing Yard switching engines should be completed before construction of the B9/EW1 project is completed.
2. Noise and Vibration - It has been determined that a feasible and reasonable noise wall is desired by the community at the following location:
  - a. City of Chicago (Wall R26) – along the BRC Tracks (75th Street), from Central Park Avenue to St. Louis Avenue and along the CN tracks (Central Park Avenue) from 75th Street to 195 feet south: This noise wall would be located on Chicago Department of Transportation (CDOT) right-of-way.

It is recommended that this noise wall be implemented as part of the B9/EW1 Project. The final decision on implementing all noise mitigation measures will be made upon the completion of the project design and public involvement process.

During final design, the City of Chicago (including the alderman) will be afforded the opportunity to provide input on noise wall design.

3. Wetlands - Prior to the project being awarded for construction, 1.52 acres of wetland credits must be purchased from an approved wetland bank as mitigation for the wetland impacts due to the project. The impacts to the existing wetlands are proposed to be mitigated by the purchase of credits from the Sauk Trail Wetland General Bank. See the Wetland Report and Coordination in Exhibit G [of the January 2013 Tech Memo] for further information.

The following two environmental commitments included in the June 2014 ECAD Tech Memo are still in effect:

1. Noise and Vibration - It has been determined that a feasible and reasonable noise wall is desired by the community at the following location:
  - a. Village of Bridgeview (Wall R12) – along the CSX tracks, from 79<sup>th</sup> Street to 75<sup>th</sup> Street. This wall will be Option 3 – a wrapped wall that requires some property acquisition; all 50 impacted residences would be benefited.

Based on the preliminary design, it is recommended that this noise wall be implemented as part of the B9/EW1 Project. The final decision on implementing all noise mitigation measures will be made upon the completion of the project design and public involvement process.

During final design, IDOT and CSX will coordinate with the Village of Bridgeview, as needed, on the final noise wall location and design details. The issues to be coordinated may include, but may not be limited to, the analysis of existing and proposed drainage conditions in the area of the proposed noise barrier, as well as finalizing the approach for property acquisition, ownership and maintenance of the proposed noise barrier. The acquisition of private property will be completed in accordance with the federal *Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970* and the *IDOT Land Acquisition Manual*.

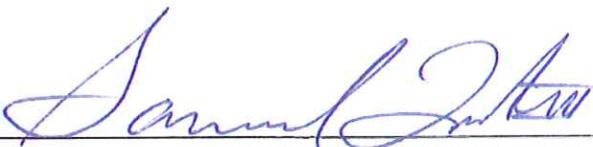
2. Prior to approval of the Phase II plans, specifications, and estimates (PS&E), IDOT and CSX will work with the Village of Bridgeview to develop and implement any agreements governing land acquisition, ownership and maintenance of the proposed noise barrier.

As a result of the proposed design changes in the area of EW1, there is one new environmental commitment for the B9/EW1 project:

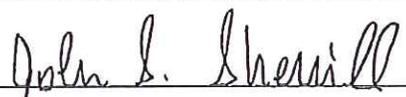
1. If excavated soils require off-site disposal, soil sampling is required to meet the requirements of an off-site disposal facility and in accordance with Illinois Administrative Code (IAC) Title 35 Part 1100 Clean Construction or Demolition Debris (CCDD) Fill Operations and Uncontaminated Soil Fill Operations (if considering soil disposal in an uncontaminated soil disposal facility) or in accordance with a Subtitle D landfill facility. If excavation is planned deeper than two feet in the area covered by this ECAD Tech Memo (ESR Addendum G), a PSI is recommended.

**Conclusion:**

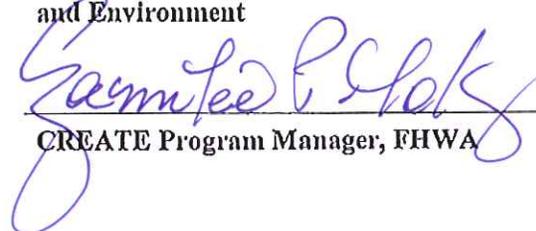
This ECAD Technical Memorandum documents the analyses and results accomplished to determine the appropriate level of environmental documentation for this project. Based on the analyses and results documented in this technical memorandum, this project has been determined to meet the Categorical Exclusion definition contained in 23 CFR 771.117. The project would not induce significant impacts to planned growth of land use for the area; would not require the relocation of significant numbers of people; would not have significant impacts on any natural, cultural, recreational, historic, or other resource; would not involve significant air, noise, or water quality impacts; would not have any significant impacts on travel patterns; and would not otherwise, either individually or cumulatively, have any significant environmental impact.

  
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Chief, IDOT Bureau of CREATE and Freight Rail

11/3/14  
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Date

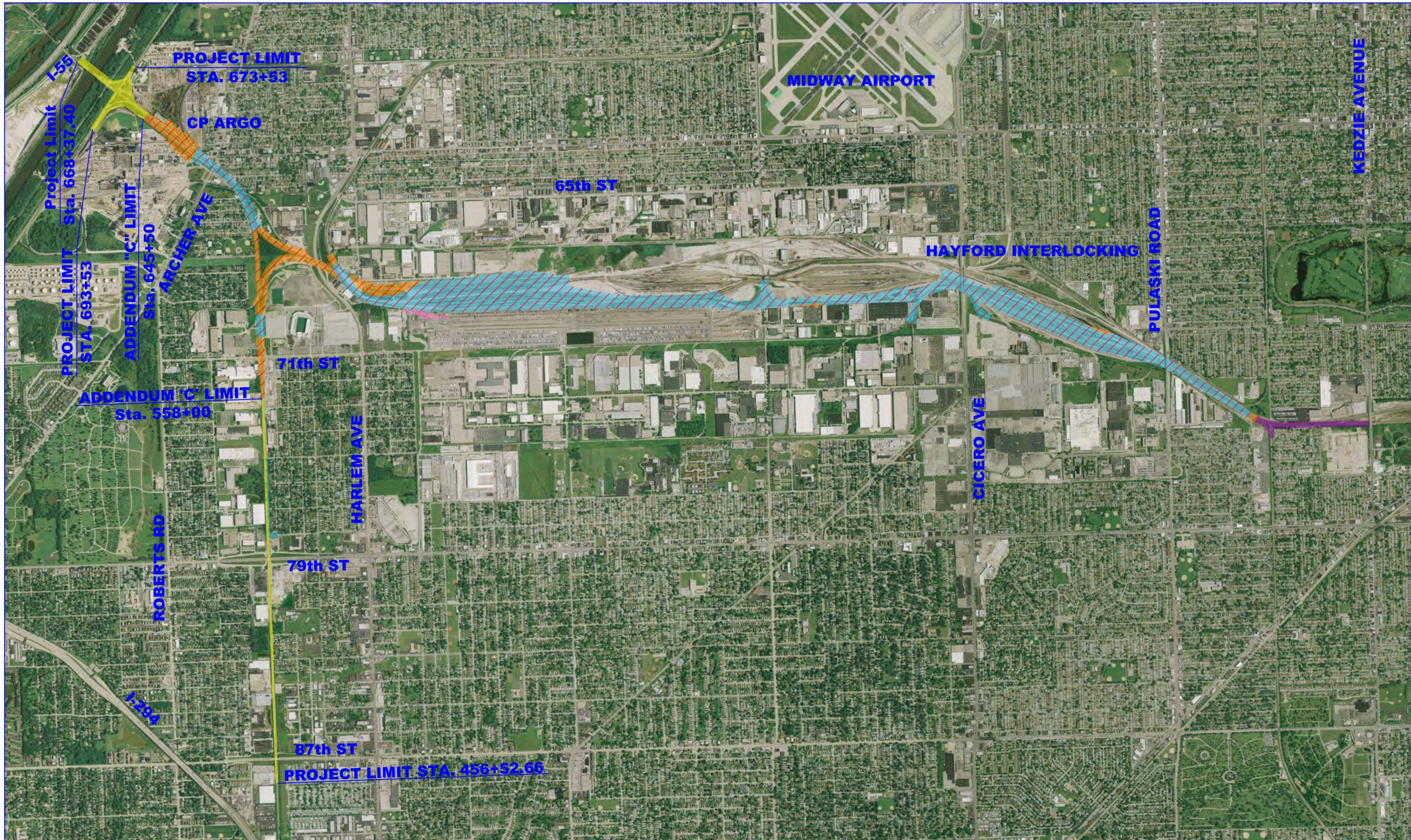
  
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Environment Section Representative – IDOT Bureau of Design and Environment

October 31, 2014  
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Date

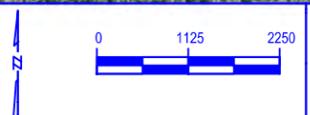
  
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CREATE Program Manager, FHWA

11/3/14  
\_\_\_\_\_  
Date

**Appendix A**  
**Location Map**



LEGEND:	B9 E/W 1 ORIGINAL PROJECT AREA	B9 E/W 1 ADDENDUM A PROJECT AREA	B9 E/W 1 ADDENDUM B PROJECT AREA	B9 E/W 1 ADDENDUM C PROJECT AREA	B9 E/W 1 ADDENDUM E PROJECT AREA	B9 E/W 1 ADDENDUM F PROJECT AREA	B9 E/W 1 ADDENDUM G PROJECT AREA



CREATE

**CREATE B9/EW1  
LOCATION MAP**

**SHEET 1 OF 1**

## **Appendix B**

# **Environmental Survey Request Addendum G**



Environmental Survey Request (ESR) for Chicago Region Environmental & Transportation Efficiency (CREATE) Program

Please complete this form and submit as follows: Email the ESR form and attachments to John.Sherrill@illinois.gov For questions about CREATE projects, contact John Sherrill at 217-785-4181.

Surveys Requested: [X] Biological [X] Cultural [ ] Special Waste

A. Project Information:

Submittal Date: 07/08/2014 Sequence #: (Note: New project sequence #s are assigned by BDE)
District: One For Addenda: Assigned Sequence #: 11745 Addendum #: G
Contract No: Requesting Agency: DPIT Project Identifier:
Job No: P-30-002-04 Route: B9/EW1 Marked:
County(ies): Cook Section: Street:
Municipality(ies): Bedford Park Project Length: km 0.3 miles
From/To (At): Station 659+50.00 (CSX) to the south and Station 674+00.00 (CSX) to the north.
Quadrangle: Berwyn Township/Range/Section: Lyons Township, T38N, 13E, S19

Survey Target Date: 12/1/14 (Six Months Minimum Required)

B. Reason for Submittal (check all that apply):

- [ ] Acquisition of Additional ROW or Easement ha/ acres
[ ] In-Stream Work Stream Name:
[X] Other (Describe): This addendum is for trackwork outside of the previous Environmental Survey Request limits.

C. Project (or Addendum) Description: The previous track alignment design was revised to modify the alignment of the intermodal track leads and industry track. No work is expected outside of the railroad's property. If industry track work outside of RR ROW is necessary, it will be done under BRC's and Univar's current agreement. No ROW acquisition.

Proposed Type of Work: [X] Railroad [ ] Highway [ ] Bridge [ ] Other

D. Tree Removal? [ ] Yes [X] No Number of Trees: ha/ acres
Existing Bridge Structure #(s): None On Historic Bridge List? [ ] Yes [X] No
Historic District Involved? [ ] Yes [X] No Historic Buildings Involved? [ ] Yes [X] No
Section 4(f) Lands Involved? [ ] Yes [X] No Section 6(f) Lands Involved? [ ] Yes [X] No

E. 404 Permit Required? [ ] Yes [X] No Anticipated Processing: ECAD

F. Consultant Contact Name: Steve Lynch Title/Company: PM/ Patrick Engineering
Telephone #: 312.201.7900 Email Address: slynch@patrickco.com



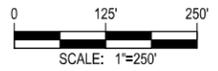
August 15, 2013



EXISTING ROW  
EXISTING RR TRACKS



ORIGINAL ESR LIMITS  
ADDENDUM G ESR LIMITS



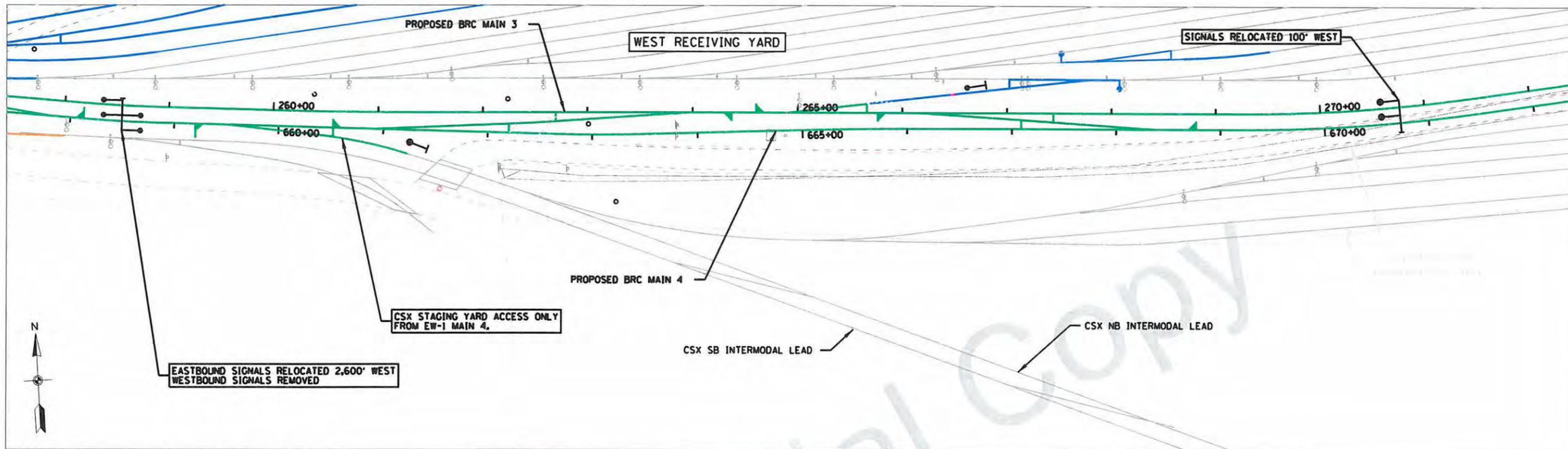
SCALE: 1"=250'

CREATE

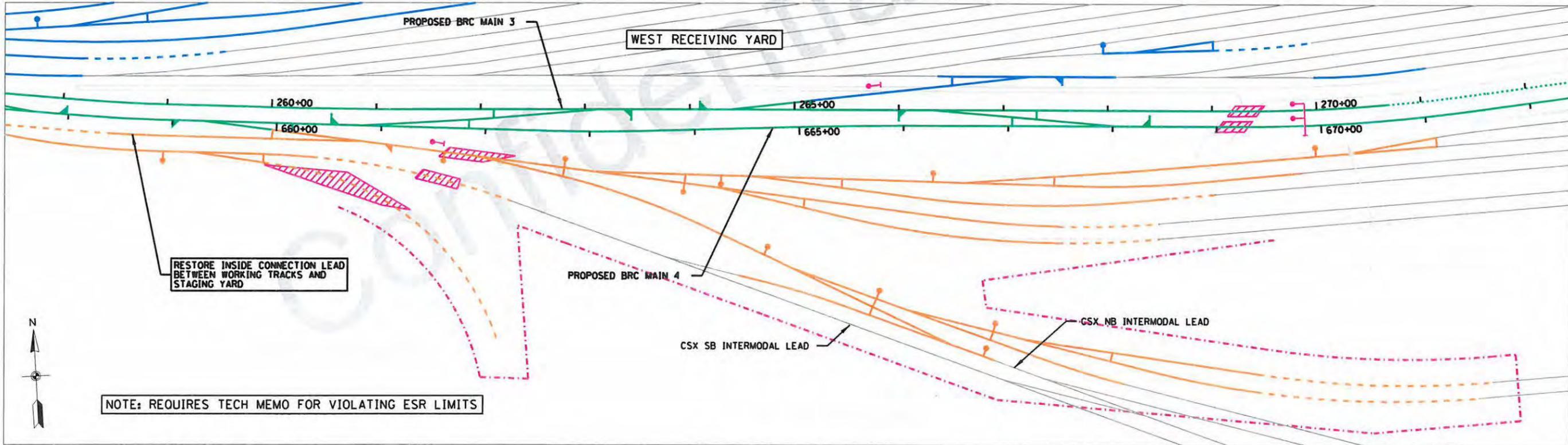
**CREATE B9/EW1  
ESRF EXHIBIT**

**ADDENDUM G**

11/13/2014 10:05:05



HORZ. SCALE: 0 50 100 **30% DESIGN STATE**  
 NEW MAINLINE TRACK    NEW BRC YARD TRACK    NEW BRC FA YARD TRACK    NEW CSX YARD TRACK



HORZ. SCALE: 0 50 100 **FINAL DESIGN STATE**

REV. NO.	DATE	BY	DESCRIPTION

DESIGNED BY	CRC
DRAWN BY	CRC
CHECKED BY	RWN
APPROVED BY	RWN
DATE SUBMITTED	01-23-2014

100 S. Wacker Drive  
 Suite 500  
 Chicago, IL 60606

BELT RAILWAY COMPANY OF CHICAGO

**CHICAGO REGION ENVIRONMENTAL AND TRANSPORTATION EFFICIENCY PROJECT**

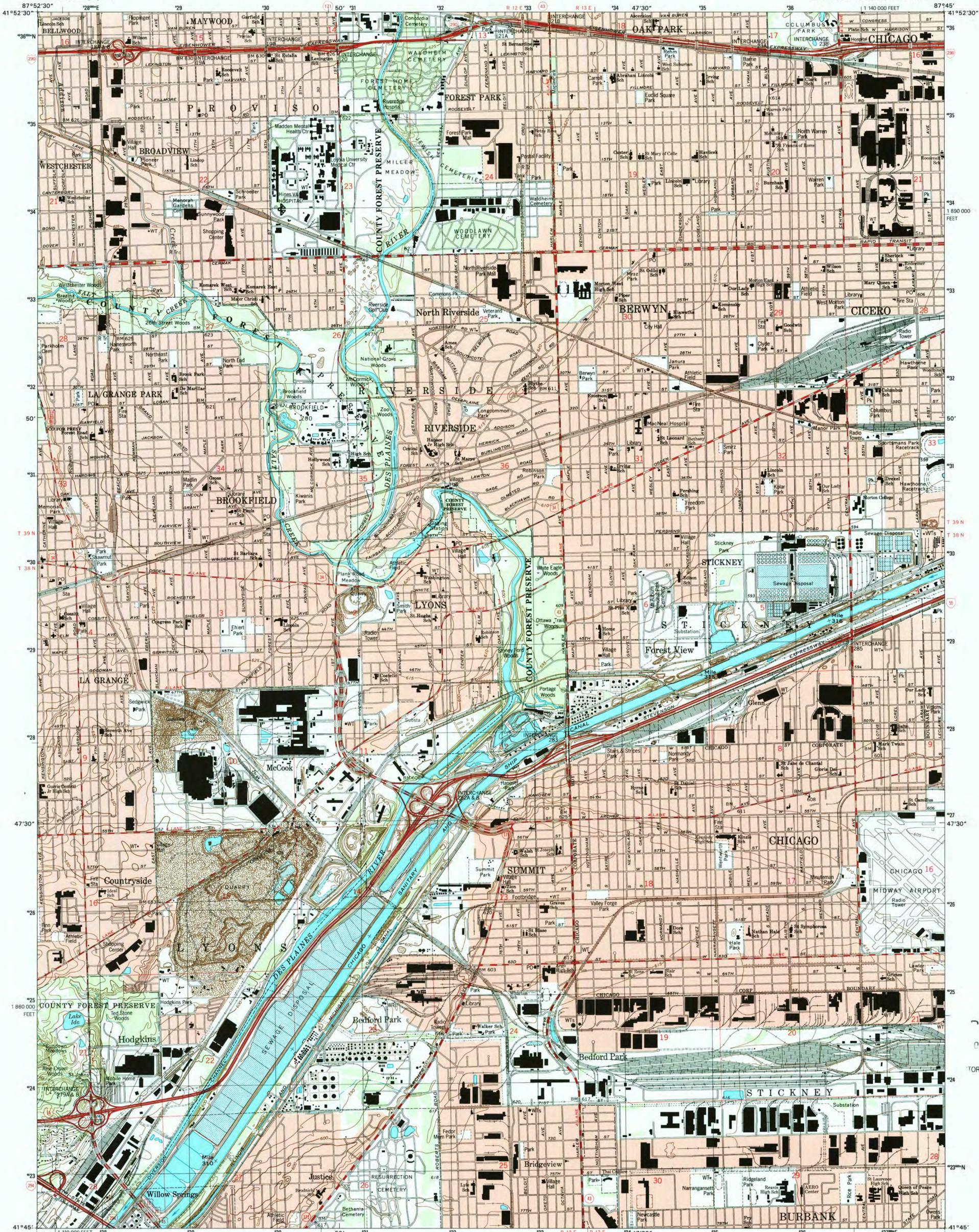
CREATE PROJECT EW1 - FINAL DESIGN  
 BELT RAILWAY MAIN TRACKS: CLEARING YARD  
 CSX BEDFORD PARK RAMP (30% VS FINAL)

DRWG. NO. **CMP-002**  
 SHEET 2 OF 5

# B&OCT/CSX Intermodal Lead Tracks



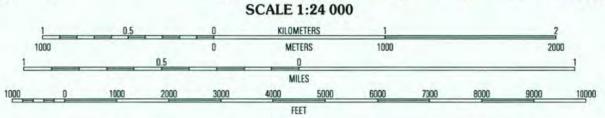




RECEIVED OCT 31 2002

GEOLOGICAL SURVEY HISTORICAL MAP ARCHIVES

Produced by the United States Geological Survey Topography compiled 1988. Planimetry derived from imagery taken 1998 and other sources. Public Land Survey System and survey control current as of 1992. Boundaries current as of 2002 North American Datum of 1983 (NAD 83). Projection and 1000-meter grid: Universal Transverse Mercator, zone 16 10 000-foot ticks: Illinois Coordinate System of 1983 (east zone) North American Datum of 1927 (NAD 27) is shown by dashed corner ticks. The values of the shift between NAD 83 and NAD 27 for 7.5-minute intersections are obtainable from National Geodetic Survey NADCON software Houses of worship, schools, and other labeled buildings verified 1992



CONTOUR INTERVAL 5 FEET NATIONAL GEODETIC VERTICAL DATUM OF 1929 TO CONVERT FROM FEET TO METERS, MULTIPLY BY 0.3048



ROAD CLASSIFICATION

Primary highway hard surface	Light-duty road, hard or improved surface
Secondary highway hard surface	Unimproved road
Interstate Route	U.S. Route
	State Route

ADJOINING 7.5' QUADRANGLES

1	2	3
4	5	6
7	8	

BERWYN, IL 1998

THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS FOR SALE BY U.S. GEOLOGICAL SURVEY, P.O. BOX 25286, DENVER, COLORADO 80225 AND ILLINOIS GEOLOGICAL SURVEY, CHAMPAIGN, ILLINOIS 61820 A FOLDER DESCRIBING TOPOGRAPHIC MAPS AND SYMBOLS IS AVAILABLE ON REQUEST

NIMA 3467 IV SE-SERIES V863





# U.S. Fish and Wildlife Service National Wetlands Inventory

EW1 Addendum G

Jul 9, 2014



## Wetlands

- Freshwater Emergent
- Freshwater Forested/Shrub
- Estuarine and Marine Deepwater
- Estuarine and Marine
- Freshwater Pond
- Lake
- Riverine
- Other

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.

User Remarks:  
ESR Addendum G

## **Appendix C**

# **Environmental Survey Request Clearances**

## Lynch, Stephen

---

**From:** Moore, Craig <Craig.Moore@parsons.com>  
**Sent:** Monday, August 04, 2014 7:19 AM  
**To:** Lynch, Stephen  
**Cc:** Pakeltis, Anthony; Cebulski, Jarrod  
**Subject:** FW: Notification of New CREATE ESR Addendum

Steve,

With this, it looks like we are all set on the ESR, right?

Thanks,

-C.Moore

---

**From:** Adin McCann [<mailto:amccann@HNTB.com>]  
**Sent:** Monday, August 04, 2014 7:18 AM  
**To:** Moore, Craig  
**Cc:** Pakeltis, Anthony; Kushto, Emily R.; Tuck, Samuel; Ronald Deverman; Michael Hurley  
**Subject:** FW: Notification of New CREATE ESR Addendum

Craig – See below. I believe this closes out the ESR for the B9/EW1 ECAD Tech Memo. Please let us know if that is not the case.

Thanks,

Adin

---

**From:** Sherrill, John [<mailto:John.Sherrill@Illinois.gov>]  
**Sent:** Friday, August 01, 2014 5:25 PM  
**To:** Adin McCann  
**Cc:** Kushto, Emily R.  
**Subject:** FW: Notification of New CREATE ESR Addendum

Adin, please forward as necessary.

This means we have Cultural and bio clearance for Seq. #: 11745G

Thanks,  
John S.

---

**From:** Eggemeyer, Emilie  
**Sent:** Friday, August 01, 2014 3:34 PM  
**To:** Sherrill, John  
**Subject:** RE: Notification of New CREATE ESR Addendum

Hello John,

Yes I believe we discussed this project and I've already reviewed it. I signed off on it 7/18/2014 and Brad didn't send it to survey. Our in-house sign-off was posted on the O Drive on 7/22/2014.

As for our earlier discussion, I believe I asked you whether you needed a SHPO concurrence for it or if an in-house clearance would suffice.

**Emilie Eggemeyer**

*Historic Architectural Compliance Specialist  
Illinois Department of Transportation  
Bureau of Design & Environment - Cultural Resources Unit  
2300 South Dirksen Parkway  
Springfield, Illinois 62764  
217-558-7223  
[Emilie.Eggemeyer@illinois.gov](mailto:Emilie.Eggemeyer@illinois.gov)*

---

**From:** Sherrill, John  
**Sent:** Thursday, July 31, 2014 4:27 PM  
**To:** Eggemeyer, Emilie  
**Subject:** FW: Notification of New CREATE ESR Addendum

Hi Emilie, have we talked about this ESR? Please see below.

Thanks,  
John S.

---

**From:** Fitts, Jean A  
**Sent:** Monday, July 14, 2014 12:00 PM  
**To:** Brooks, Thomas C; McConkey, Kristine A  
**Cc:** Sherrill, John  
**Subject:** Notification of New CREATE ESR Addendum

The following ESR Addendum for a CREATE project requesting Biological and Cultural Surveys was received on 7/11/14. A folder containing the ESR form and all attachments has been posted on the O drive for your use.

O:\EnvProjects\Railroad Projects\CREATE

Seq. #: 11745G  
District: 1  
County: Cook  
Survey Target Date: 12/1/14

---

*This e-mail and any files transmitted with it are confidential and are intended solely for the use of the individual or entity to whom they are addressed. If you are NOT the intended recipient and receive this communication, please delete this message and any attachments. Thank you.*

# **Appendix D**

## **Air Quality**

CREATE Project B9/EW1 Extension  
4/28/2011  
Air Quality Results  
96 Hours

<u>Options</u>	<u>Fuel (Gallons)</u>
Current Operation	10,488
CREATE Build Option- Year 2029	30,194
No-Build Option- Year 2029	12,851

Project  
Construction Year

B9/EW1 Extension  
2016

General Conformity Analysis

Construction Year Analysis				
	Tons/YR			
	HC	NO <sub>x</sub>	PM 10	PM 2.5
Construction Emissions 2016	3.9870	29.3738	2.4807	2.3994
Threshold	100	100	100	100
Does Construction Year Total Emissions Exceed Threshold?	N	N	N	N

Microscale Analysis

Design Year Analysis				
	Tons/YR			
	HC	NO <sub>x</sub>	PM 10	PM 2.5
Operations Emissions 2029 No Build	3.1023	82.7283	1.6804	1.6300
Operations Emissions 2029 Build	7.2890	73.0738	3.9482	3.8298
Delta Emissions due to build	4.1867	-9.6545	2.2678	2.1998
Threshold	100	100	100	100
Does Design Year Delta Exceed Threshold?	N	N	N	N

**Table 1: EPA Emission Factors for Locomotives (2009 version)**

Year	HC (grams / gal)	CO (grams / gal)	NO <sub>x</sub> (grams / gal)	PM (grams / gal)	PM <sub>2.5</sub> (grams / gal)	SO <sub>2</sub> (lbs / gal)
2009	9.1	26.6	172.0	4.9	4.753	0.036
2029	2.4	26.6	64.0	1.3	1.261	0.000216

**Table 2: Microscale Analysis - Locomotive Air Emissions Analysis**

Year	HC (tons per year)	CO (tons per year)	NO <sub>x</sub> (tons per year)	PM (tons per year)	PM <sub>2.5</sub> (tons per year)	SO <sub>2</sub> (tons per year)
2009 Existing Condition	9.60	28.06	181.45	5.17	5.01	17.23
2029 Build Alternative	7.29	80.79	194.37	3.95	3.83	0.30
*Reduction from BRC Clearing yard switching engines replacemnt	0	0	-121.3	0	0	0
2029 Build Condition	7.29	80.79	73.07	3.95	3.83	0.30
2029 No-Build	3.10	34.38	82.73	1.68	1.63	0.13

\* See "CREATE B9/EW1 Nox Emissions Analysis" dated February 9, 2012

Project B9/EW1 Extension  
 Construction Year 2016

Emission Calculations for Hydrocarbons

Equipment	HP	HR/YR	EF	Grams/YR	TONS/YR
<b>B9 With Extension</b>					
<b>Specialized Railroad Eqpt.</b>					
Ballast Regulators	185	300	0.670	37,185	0.0410
Ballast Tampers	260	300	0.670	52,260	0.0576
Portable Rail Grinders (gas)	1	100	19.007	1,901	0.0021
Portable Rail Saws (gas)	1	100	19.007	1,901	0.0021
Work Trains	1500	100	0.829	124,350	0.1371
Brandt Power Units	200	20	0.670	2,680	0.0030
<b>General Construction Eqpt.</b>					
Backhoes	100	200	0.883	17,660	0.0195
Backhoes/Loaders	250	300	0.567	42,525	0.0469
Bulldozers	300	200	0.170	10,200	0.0112
Cranes	200	100	0.184	3,680	0.0041
Cranes	300	400	0.184	22,080	0.0243
Excavators	300	750	0.161	36,225	0.0399
Graders	200	40	0.169	1,352	0.0015
Loaders	150	100	0.639	9,585	0.0106
Lowboys	500	75	0.227	8,513	0.0094
Rollers/Compactors	110	180	0.203	4,019	0.0044
Saws - Concrete/Pavement	50	20	1.030	1,030	0.0011
Sheet Pile Driving Equipment	250	40	0.323	3,230	0.0036
Trucks - Construction	300	450	0.144	19,440	0.0214
<b>Total Tons/Yr Construction Emissions</b>					<b>0.4407</b>

**EW1**

<b>Specialized Railroad Eqpt.</b>					
Ballast Regulators	185	1600	0.670	198,320	0.2186
Ballast Tampers	260	1600	0.670	278,720	0.3072
Portable Rail Drills	3	48	1.011	146	0.0002
Portable Rail Grinders (gas)	1	100	19.007	1,901	0.0021
Portable Rail Saws (gas)	1	100	19.007	1,901	0.0021
Self Propelled Anchor Applicators	23	500	0.833	9,580	0.0106
Self Propelled Driver/Setters	36	1200	0.522	22,550	0.0249
Tie Remover/Inserters	125	800	0.749	74,900	0.0826
Work Trains	1500	1500	0.829	1,865,250	2.0561
<b>General Construction Eqpt.</b>					
Backhoes	100	800	0.883	70,640	0.0779
Backhoes/Loaders	250	1500	0.567	212,625	0.2344
Bulldozers	300	800	0.170	40,800	0.0450
Compressors - Air	100	1000	0.294	29,400	0.0324
Cranes	200	200	0.184	7,360	0.0081
Excavators	300	700	0.161	33,810	0.0373
Graders	200	500	0.169	16,900	0.0186
Loaders	150	1000	0.639	95,850	0.1057
Miscellaneous Equipment	150	1000	0.236	35,400	0.0390
Rollers/Compactors	110	500	0.203	11,165	0.0123
Sheet Pile Driving Equipment	250	200	0.323	16,150	0.0178
Speed Swings	300	2000	0.216	129,600	0.1429
Trucks - Construction	300	1000	0.144	43,200	0.0476

	MPH <sup>a</sup>	HR/YR	EF (g/mi) <sup>b</sup>	Grams/YR	TONS/YR
Light Duty Vehicles (Off Site)	50	3500	0.120	21,000	0.0231

<sup>a</sup> Traveling Speed assumed to be 50 miles per hour for off-site vehicles.

<sup>b</sup> Emission factor taken from EPA's MOVES2010b model.

**Total Tons/Yr Construction Emissions 3.5463**

**PROJECT TOTAL 3.9870**

Project B9/EW1 Extension  
 Construction Year 2016

Emission Calculations for Nitrogen Oxides

Equipment	HP	HR/YR	EF	Grams/YR	TONS/YR
<b>B9 With Extension</b>					
<b>Specialized Railroad Eqpt.</b>					
Ballast Regulators	185	300	4.304	238,872	0.2633
Ballast Tampers	260	300	4.304	335,712	0.3701
Portable Rail Grinders (gas)	1	100	2.677	268	0.0003
Portable Rail Saws (gas)	1	100	2.677	268	0.0003
Work Trains	1500	100	5.963	894,450	0.9860
Brandt Power Units	200	20	4.304	17,216	0.0190
<b>General Construction Eqpt.</b>					
Backhoes	100	200	4.285	85,700	0.0945
Backhoes/Loaders	250	300	3.763	282,225	0.3111
Bulldozers	300	200	1.554	93,240	0.1028
Cranes	200	100	1.945	38,900	0.0429
Cranes	300	400	1.945	233,400	0.2573
Excavators	300	750	1.342	301,950	0.3328
Graders	200	40	1.521	12,168	0.0134
Loaders	150	100	3.992	59,880	0.0660
Lowboys	500	75	3.284	123,150	0.1357
Rollers/Compactors	110	180	2.041	40,412	0.0445
Saws - Concrete/Pavement	50	20	595.497	595,497	0.6564
Sheet Pile Driving Equipment	250	40	3.968	39,680	0.0437
Trucks - Construction	300	450	0.859	115,965	0.1278
<b>Total Tons/Yr Construction Emissions</b>					<b>3.8680</b>

**EW1**

<b>Specialized Railroad Eqpt.</b>					
Ballast Regulators	185	1600	4.304	1,273,984	1.4043
Ballast Tampers	260	1600	4.304	1,790,464	1.9736
Portable Rail Drills	3	48	4.915	708	0.0008
Portable Rail Grinders (gas)	1	100	2.677	268	0.0003
Portable Rail Saws (gas)	1	100	2.677	268	0.0003
Self Propelled Anchor Applicators	23	500	4.861	55,902	0.0616
Self Propelled Driver/Setters	36	1200	4.431	191,419	0.2110
Tie Remover/Inserters	125	800	4.552	455,200	0.5018
Work Trains	1500	1500	5.963	13,416,750	14.7894
<b>General Construction Eqpt.</b>					
Backhoes	100	800	4.285	342,800	0.3779
Backhoes/Loaders	250	1500	3.763	1,411,125	1.5555
Bulldozers	300	800	1.554	372,960	0.4111
Compressors - Air	100	1000	2.885	288,500	0.3180
Cranes	200	200	1.945	77,800	0.0858
Excavators	300	700	1.342	281,820	0.3107
Graders	200	500	1.521	152,100	0.1677
Loaders	150	1000	3.992	598,800	0.6601
Miscellaneous Equipment	150	1000	2.493	373,950	0.4122
Rollers/Compactors	110	500	2.041	112,255	0.1237
Sheet Pile Driving Equipment	250	200	3.968	198,400	0.2187
Speed Swings	300	2000	2.351	1,410,600	1.5549
Trucks - Construction	300	1000	0.859	257,700	0.2841

	MPH <sup>a</sup>	HR/YR	EF (g/mi) <sup>b</sup>	Grams/YR	TONS/YR
Light Duty Vehicles (Off Site)	50	3500	0.427	74,725	0.0824

<sup>a</sup> Traveling Speed assumed to be 50 miles per hour for off-site vehicles.

<sup>b</sup> Emission factor taken from EPA's MOVES2010b model.

**Total Tons/Yr Construction Emissions 25.5058**

**PROJECT TOTAL 29.3738**

Project B9/EW1 Extension  
 Construction Year 2016

Emission Calculations for Particulate Matter 10

Equipment	HP	HR/YR	EF	Grams/YR	TONS/YR
<b>B9 With Extension</b>					
<b>Specialized Railroad Eqpt.</b>					
Ballast Regulators	185	300	0.454	25,197	0.0278
Ballast Tampers	260	300	0.454	35,412	0.0390
Portable Rail Grinders (gas)	1	100	0.156	16	0.0000
Portable Rail Saws (gas)	1	100	0.156	16	0.0000
Work Trains	1500	100	0.482	72,300	0.0797
Brandt Power Units	200	20	0.454	1,816	0.0020
<b>General Construction Eqpt.</b>					
Backhoes	100	200	0.773	15,460	0.0170
Backhoes/Loaders	250	300	0.368	27,600	0.0304
Bulldozers	300	200	0.100	6,000	0.0066
Cranes	200	100	0.089	1,780	0.0020
Cranes	300	400	0.089	10,680	0.0118
Excavators	300	750	0.081	18,225	0.0201
Graders	200	40	0.098	784	0.0009
Loaders	150	100	0.470	7,050	0.0078
Lowboys	500	75	0.200	7,500	0.0083
Rollers/Compactors	110	180	0.202	4,000	0.0044
Saws - Concrete/Pavement	50	20	0.000	-	0.0000
Sheet Pile Driving Equipment	250	40	0.210	2,100	0.0023
Trucks - Construction	300	450	0.030	4,050	0.0045
<b>Total Tons/Yr Construction Emissions</b>					<b>0.2645</b>

**EW1**

<b>Specialized Railroad Eqpt.</b>					
Ballast Regulators	185	1600	0.454	134,384	0.1481
Ballast Tampers	260	1600	0.454	188,864	0.2082
Portable Rail Drills	3	48	0.706	102	0.0001
Portable Rail Grinders (gas)	1	100	0.156	16	0.0000
Portable Rail Saws (gas)	1	100	0.156	16	0.0000
Self Propelled Anchor Applicators	23	500	0.535	6,153	0.0068
Self Propelled Driver/Setters	36	1200	0.432	18,662	0.0206
Tie Remover/Inserters	125	800	0.549	54,900	0.0605
Work Trains	1500	1500	0.482	1,084,500	1.1955
<b>General Construction Eqpt.</b>					
Backhoes	100	800	0.773	61,840	0.0682
Backhoes/Loaders	250	1500	0.368	138,000	0.1521
Bulldozers	300	800	0.100	24,000	0.0265
Compressors - Air	100	1000	0.353	35,300	0.0389
Cranes	200	200	0.089	3,560	0.0039
Excavators	300	700	0.081	17,010	0.0188
Graders	200	500	0.098	9,800	0.0108
Loaders	150	1000	0.470	70,500	0.0777
Miscellaneous Equipment	150	1000	0.223	33,450	0.0369
Rollers/Compactors	110	500	0.202	11,110	0.0122
Sheet Pile Driving Equipment	250	200	0.210	10,500	0.0116
Speed Swings	300	2000	0.153	91,800	0.1012
Trucks - Construction	300	1000	0.030	9,000	0.0099

	MPH <sup>a</sup>	HR/YR	EF (g/mi) <sup>b</sup>	Grams/YR	TONS/YR
Light Duty Vehicles (Off Site)	50	3500	0.040	7,000	0.0077

<sup>a</sup> Traveling Speed assumed to be 50 miles per hour for off-site vehicles.

<sup>b</sup> Emission factor taken from EPA's MOVES2010b model.

**Total Tons/Yr Construction Emissions 2.2162**

**PROJECT TOTAL 2.4807**

Project B9/EW1 Extension  
 Construction Year 2016

Emission Calculations for Particulate Matter 2.5

Equipment	HP	HR/YR	EF	Grams/YR	TONS/YR
<b><u>B9 With Extension</u></b>					
<b>Specialized Railroad Eqpt.</b>					
Ballast Regulators	185	300	0.440	24,420	0.0269
Ballast Tampers	260	300	0.440	34,320	0.0378
Portable Rail Grinders (gas)	1	100	0.143	14	0.0000
Portable Rail Saws (gas)	1	100	0.143	14	0.0000
Work Trains	1500	100	0.467	70,050	0.0772
Brandt Power Units	200	20	0.440	1,760	0.0019
<b>General Construction Eqpt.</b>					
Backhoes	100	200	0.750	15,000	0.0165
Backhoes/Loaders	250	300	0.357	26,775	0.0295
Bulldozers	300	200	0.097	5,820	0.0064
Cranes	200	100	0.086	1,720	0.0019
Cranes	300	400	0.086	10,320	0.0114
Excavators	300	750	0.078	17,550	0.0193
Graders	200	40	0.095	760	0.0008
Loaders	150	100	0.456	6,840	0.0075
Lowboys	500	75	0.194	7,275	0.0080
Rollers/Compactors	110	180	0.195	3,861	0.0043
Saws - Concrete/Pavement	50	20	0.000	-	0.0000
Sheet Pile Driving Equipment	250	40	0.203	2,030	0.0022
Trucks - Construction	300	450	0.029	3,915	0.0043
<b>Total Tons/Yr Construction Emissions</b>					<b>0.2562</b>
<b><u>EW1</u></b>					
<b>Specialized Railroad Eqpt.</b>					
Ballast Regulators	185	1600	0.440	130,240	0.1436
Ballast Tampers	260	1600	0.440	183,040	0.2018
Portable Rail Drills	3	48	0.685	99	0.0001
Portable Rail Grinders (gas)	1	100	0.143	14	0.0000
Portable Rail Saws (gas)	1	100	0.143	14	0.0000
Self Propelled Anchor Applicators	23	500	0.519	5,969	0.0066
Self Propelled Driver/Setters	36	1200	0.419	18,101	0.0200
Tie Remover/Inserters	125	800	0.533	53,300	0.0588
Work Trains	1500	1500	0.467	1,050,750	1.1583
<b>General Construction Eqpt.</b>					
Backhoes	100	800	0.750	60,000	0.0661
Backhoes/Loaders	250	1500	0.357	133,875	0.1476
Bulldozers	300	800	0.097	23,280	0.0257
Compressors - Air	100	1000	0.343	34,300	0.0378
Cranes	200	200	0.086	3,440	0.0038
Excavators	300	700	0.078	16,380	0.0181
Graders	200	500	0.095	9,500	0.0105
Loaders	150	1000	0.456	68,400	0.0754
Miscellaneous Equipment	150	1000	0.217	32,550	0.0359
Rollers/Compactors	110	500	0.195	10,725	0.0118
Sheet Pile Driving Equipment	250	200	0.203	10,150	0.0112
Speed Swings	300	2000	0.148	88,800	0.0979
Trucks - Construction	300	1000	0.029	8,700	0.0096
			<b>EF</b>		
	<b>MPH<sup>a</sup></b>	<b>HR/YR</b>	<b>(g/mi)<sup>b</sup></b>	<b>Grams/YR</b>	<b>TONS/YR</b>
Light Duty Vehicles (Off Site)	50	3500	0.015	2,625	0.0029
<sup>a</sup> Traveling Speed assumed to be 50 miles per hour for off-site vehicles.					
<sup>b</sup> Emission factor taken from EPA's MOVES2010b model.					
<b>Total Tons/Yr Construction Emissions</b>					<b>2.1432</b>
<b>PROJECT TOTAL</b>					<b>2.3994</b>

# **Appendix E**

## **Tech Memo**

### **Cook County MSAT Emissions**

## TECHNICAL MEMORANDUM

### Locomotive and On-Road Vehicle Class-Specific MSAT Emissions Trends Data Incorporating County-Specific Baseline Emissions Estimates

#### CREATE Program

October 2014

This memorandum documents the development and analysis of Mobile Source Air Toxics (MSAT) emissions for Cook County, Illinois. This data, which is more specific to the context of the Chicago Region Environmental and Transportation Efficiency (CREATE) Program, is being developed to supplement the national-level trends presented in the FHWA's Interim MSAT Guidance (FHWA, 2012). This data will be used as part of the MSAT analyses conducted for the CREATE Program projects.

#### 1. Background

Controlling air toxic emissions became a national priority with the passage of the Clean Air Act Amendments (CAAA) of 1990, whereby Congress mandated that the EPA regulate 188 air toxics, also known as hazardous air pollutants (HAPs). The Environmental Protection Agency (EPA) has assessed this expansive list in their latest rule on the Control of Hazardous Air Pollutants from Mobile Sources (EPA, 2007), and identified a group of 93 compounds emitted from mobile sources that are listed in their Integrated Risk Information System, or IRIS (EPA, 2012a). These compounds are commonly referred to as Mobile Source Air Toxics (MSATs). In addition, from their 1999 National Air Toxics Assessment (NATA) the EPA identified seven compounds with significant contributions from mobile sources that are among the national and regional-scale cancer risk drivers. These are acrolein, benzene, 1,3-butadiene, diesel particulate matter (DPM), formaldehyde, naphthalene, and polycyclic organic matter (POM). The Federal Highway Administration (FHWA) has published updated guidance (*Interim MSAT Guidance*) for analyzing MSAT impacts generated by highway projects (FHWA, 2012). The FHWA identifies the preceding seven compounds as priority MSATs. The following summarizes HAPs of particular concern for which mobile sources make substantial contributions to total emissions. This information is taken from the most recently-released NATA (EPA, 2012b), which uses 2005 as a base analysis year:

National cancer risk driver:

- Formaldehyde

Regional cancer risk drivers:

- Benzene
- Polycyclic Aromatic Hydrocarbons (PAHs), a subset of POM
- Naphthalene

National cancer risk contributors:

- 1,3-Butadiene

- Acetaldehyde

National noncancer hazard drivers:

- Acrolein

Regional noncancer hazard drivers:

- DPM

## **2. Methodology**

The FHWA's Interim MSAT Guidance includes a chart that demonstrates predicted future national trends in vehicle miles traveled (VMT) and emissions of the priority MSATs for the entire on-road vehicle fleet. However, relevant, source category-specific future MSAT emissions predictions for a region-wide superset of the study area (i.e., Cook County) were not available.

To better assess the MSAT implications of the CREATE Program projects, Cook County trend data was developed that is more specific to the Program context than the national-level trends presented in the FHWA's Interim MSAT Guidance for on-road vehicles as a whole (FHWA, 2012). The benefits of this greater specificity include:

- Provision of a more geographically-specific emissions baseline;
- Inclusion of a key mobile emissions source (locomotives) that is both the subject of this project and an unusually important baseline emissions source within the project study area; and
- Isolation of an on-road vehicle source category – heavy-duty trucks – that is also particularly important within the project study area and whose activity could be affected by CREATE projects that influence freight transportation modes.

These trend data are not intended to represent project- and CREATE Program-specific MSAT emissions predictions; such predictions are beyond the reasonable scope of the air quality assessment conducted as part of the Environmental Impact Statement to fulfill the requirements of the National Environmental Policy Act (NEPA). Rather, they are intended to provide a more appropriate and relevant estimate of baseline and future emissions that takes into account both the geographic context and the type of vehicles affected by the proposed project.

### **Cook-County-specific Baseline Emissions Estimates**

To accomplish this, EPA-promulgated predictions of future nationwide trends in emissions (EPA, 2008) were utilized to forecast relative changes in predicted 2008 baseline county-wide emissions (EPA, 2013). Predicted changes in emissions over time reflect both anticipated changes in emissions rates per unit of activity (e.g., vehicle miles traveled, gallons of fuel consumed, etc.) and changes in activity rates (e.g., the number of active vehicles and the amount of activity – miles traveled or gallons consumed, etc. – per vehicle). The baseline national data was taken from the most recent (2008) EPA National Emissions Inventory (NEI).

Table 1 presents an excerpt of an emissions data processing spreadsheet that includes Cook-County-specific estimates of locomotive MSAT emissions from that dataset (EPA, 2013). Table 2 presents corresponding data for on-road vehicular emissions.

### **Incorporation of National-level Predicted Future Emissions Trends**

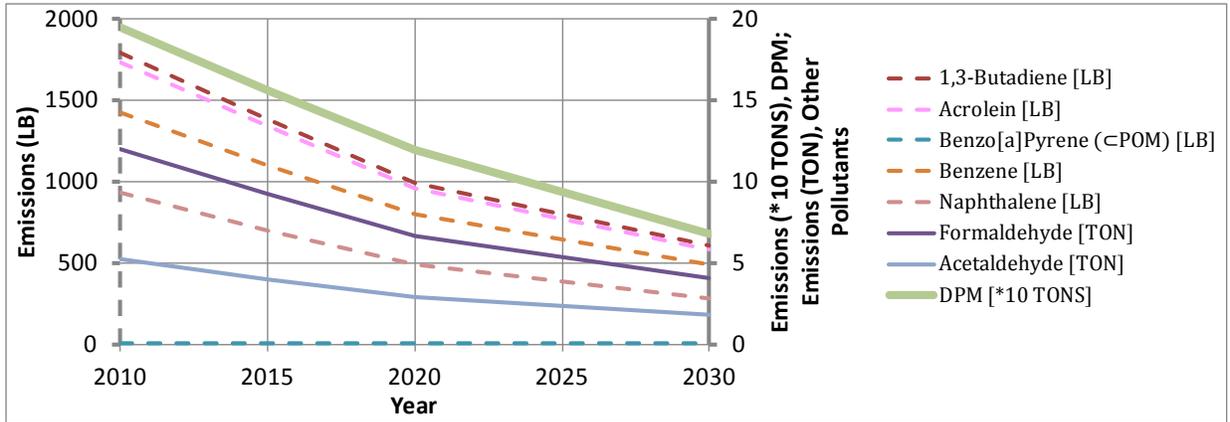
In the absence of identified geographically-specific future MSAT emissions predictions, this assessment applies predicted relative trends in future nationwide MSAT emissions to the aforementioned Cook County baseline emissions data. Table 3 includes relevant EPA-derived (EPA, 2008) predicted future trends in gaseous MSAT emissions from locomotives. Table 4 provides analogous data for particulate matter less than 10 microns in diameter ( $PM_{10}$ ), the relative trend data for which is applied here as a surrogate for future trends in diesel PM (DPM) emissions. Finally, Table 5 summarizes EPA-promulgated predictions of future nationwide MSAT emissions from on-road vehicles (EPA, 2005 and 2006) and the relative future emissions trends derived from them.

### **3. Results**

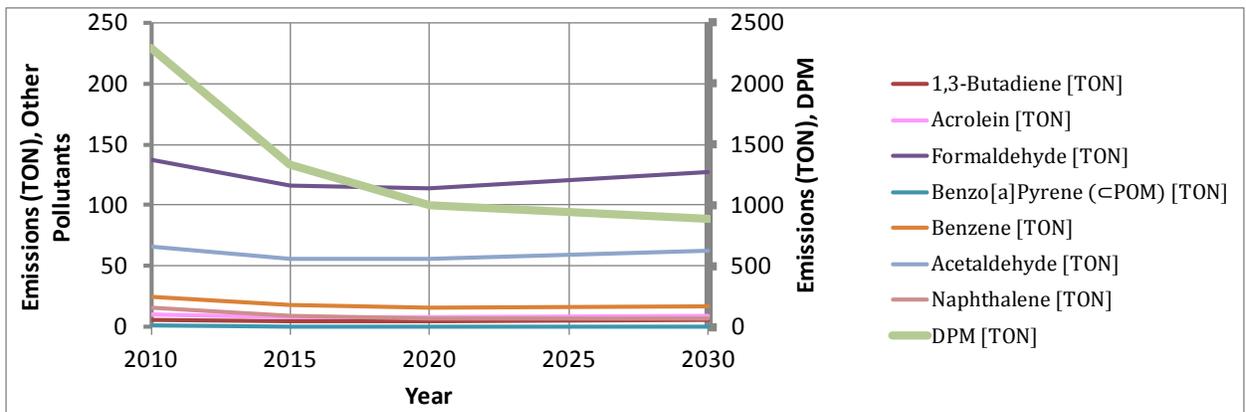
EPA's adopted regulations for diesel locomotive engine/exhaust systems and fuels are predicted to result in reductions in activity-based emission rates that more than counteract predicted increases in locomotive activity levels throughout the nation. As Figure 1(a) shows, the anticipated result is a decrease in annual MSAT emissions from locomotives despite those projected activity level increases.

Figures 1(b) and 1(c) demonstrate that MSAT emissions from light- and heavy-duty on-road motor vehicles are expected to decrease or – in the case of DPM for light-duty on-road vehicles – increase slightly over time. In the case of DPM, future reductions in emissions from heavy-duty on-road vehicles are predicted to exceed future increases in emissions from corresponding light-duty vehicles. Given the projected future reductions in DPM emissions from locomotives, the overall national trend for DPM emissions from ground transportation sources is downward for areas influenced by emissions from both on-road vehicles and locomotives. In the case of formaldehyde and acetaldehyde, the corresponding overall nationwide trend for ground transportation sources is a decrease in emissions through 2020 followed by a slight increase in emissions (driven by heavy-duty on-road vehicles) over the subsequent ten years.

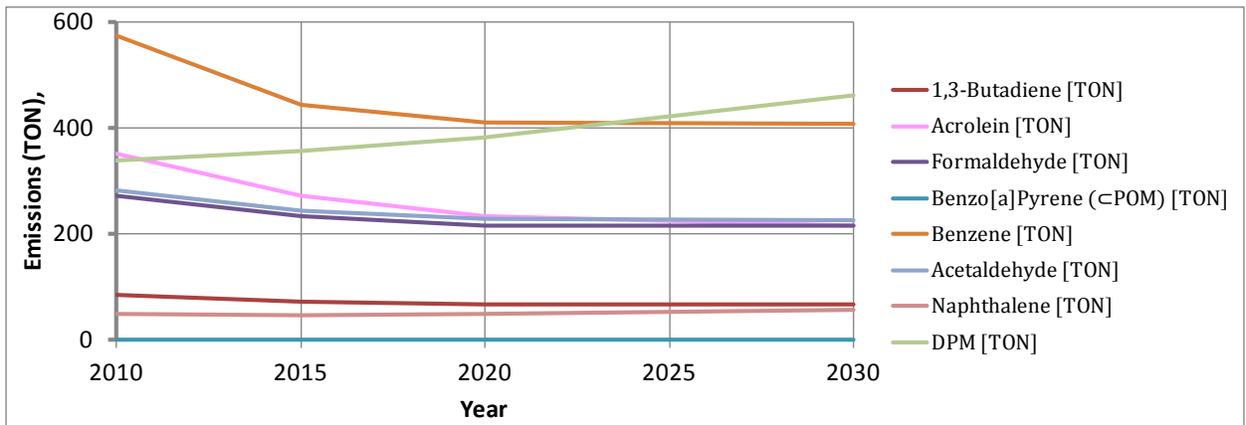
Within the area encompassed by the CREATE Program, the magnitude and the duration of these potential increases cannot be reliably quantified due to incomplete or unavailable information in forecasting project-specific MSAT health impacts. In sum, the localized level of MSAT emissions for CREATE Program projects could be higher relative to the No Build condition, but this could be offset due to increases in speeds and reductions in congestion (which are associated with lower MSAT emissions). Also, MSAT emissions will be lower in other locations when traffic shifts away from them. However, on a regional basis, EPA's vehicle and fuel regulations, coupled with fleet turnover, will over time cause substantial reductions that, in almost all cases, will cause region-wide MSAT emission levels to be substantially lower than today.



(a) Locomotives



(b) Heavy-duty On-road Vehicles



(c) Light-duty On-road Vehicles

Sources: EPA, 2006, 2008, 2012

**Figure 1: Predicted Annual Emissions of Priority MSATs within Cook County by Mobile Source Type**

**Table 1 – Excerpt of Spreadsheet Used to Process Cook-County-Specific Baseline MSAT Emissions Estimates as Reference for Prediction of Future MSAT Trends**

[ftp://ftp.epa.gov/EmisInventory/2008v2/nei2008v2\\_national\\_county\\_level\\_sector.zip](ftp://ftp.epa.gov/EmisInventory/2008v2/nei2008v2_national_county_level_sector.zip)

fips	stfips	ctyfips	state_abbr	county_name	El_Sector		description	Representing	Equivalent	uom	2008	Final Units	Pollutant
17031	17	31	IL	Cook	Mobile - Locomotives	Locomotives	1,3-Butadiene	1,3-Butadiene	1,3-Butadiene	LB	1936.285422	LB	1,3-Butadiene [LB]
17031	17	31	IL	Cook	Mobile - Locomotives	Locomotives	Acrolein	Acrolein	Acrolein	LB	1863.572657	LB	Acrolein [LB]
17031	17	31	IL	Cook	Mobile - Locomotives	Locomotives	Formaldehyde	Formaldehyde	Formaldehyde	LB	25821.69545	TON	Formaldehyde [TON]
17031	17	31	IL	Cook	Mobile - Locomotives	Locomotives	Benzo[a]Pyrene	Benzo[a]Pyrene (iPOM)	POM	LB	1.114772852	LB	Benzo[a]Pyrene (cPOM) [LB]
17031	17	31	IL	Cook	Mobile - Locomotives	Locomotives	Benzene	Benzene	Benzene	LB	1542.21503	LB	Benzene [LB]
17031	17	31	IL	Cook	Mobile - Locomotives	Locomotives	Acetaldehyde	Acetaldehyde	Acetaldehyde	LB	11206.51198	TON	Acetaldehyde [TON]
17031	17	31	IL	Cook	Mobile - Locomotives	Locomotives	Naphthalene	Naphthalene	Naphthalene	LB	1044.725948	LB	Naphthalene [LB]
17031	17	31	IL	Cook	Mobile - Locomotives	Locomotives	PM10 Primary (Filt + Cond)	DPM	POM	TON	202.8152776	*10 TONS	DPM [*10 TONS]

Source: EPA, 2013; Parsons, 2013

**Table 2 – Excerpt of Spreadsheet Used to Process Cook-County-Specific Baseline MSAT Emissions Estimates as Reference for Prediction of Future MSAT Trends**

[ftp://ftp.epa.gov/EmisInventory/2008v2/nei2008v2\\_national\\_county\\_level\\_sector.zip](ftp://ftp.epa.gov/EmisInventory/2008v2/nei2008v2_national_county_level_sector.zip)

fips	stfips	ctyfips	state_abbr	county_name	El_Sector		description	Representing	Equivalent	uom	2008	Final Units	Pollutant
17031	17	31	IL	Cook	Mobile - On-Road Diesel Heavy Duty Vehicles	H DVs	1,3-Butadiene	1,3-Butadiene	1,3-Butadiene	LB	15385.34198	TON	1,3-Butadiene [TON]
17031	17	31	IL	Cook	Mobile - On-Road Diesel Heavy Duty Vehicles	H DVs	Acrolein	Acrolein	Acrolein	LB	26305.04471	TON	Acrolein [TON]
17031	17	31	IL	Cook	Mobile - On-Road Diesel Heavy Duty Vehicles	H DVs	Formaldehyde	Formaldehyde	Formaldehyde	LB	323191.6845	TON	Formaldehyde [TON]
17031	17	31	IL	Cook	Mobile - On-Road Diesel Heavy Duty Vehicles	H DVs	Benzo[a]Pyrene	Benzo[a]Pyrene (iPOM)	POM	LB	2951.345857	TON	Benzo[a]Pyrene (cPOM) [TON]
17031	17	31	IL	Cook	Mobile - On-Road Diesel Heavy Duty Vehicles	H DVs	Benzene	Benzene	Benzene	LB	61622.59152	TON	Benzene [TON]
17031	17	31	IL	Cook	Mobile - On-Road Diesel Heavy Duty Vehicles	H DVs	Acetaldehyde	Acetaldehyde	Acetaldehyde	LB	152010.341	TON	Acetaldehyde [TON]
17031	17	31	IL	Cook	Mobile - On-Road Diesel Heavy Duty Vehicles	H DVs	Naphthalene	Naphthalene	Naphthalene	LB	37446.62871	TON	Naphthalene [TON]
17031	17	31	IL	Cook	Mobile - On-Road Diesel Heavy Duty Vehicles	H DVs	PM10 Primary (Filt + Cond)	DPM	POM	TON	2756.551751	TON	DPM [TON]
17031	17	31	IL	Cook	Mobile - On-Road Diesel Heavy Duty Vehicles	LDVs	1,3-Butadiene	1,3-Butadiene	1,3-Butadiene	LB	215344.8759	TON	1,3-Butadiene [TON]
17031	17	31	IL	Cook	Mobile - On-Road Diesel Heavy Duty Vehicles	LDVs	Acrolein	Acrolein	Acrolein	LB	39917.19615	TON	Acrolein [TON]
17031	17	31	IL	Cook	Mobile - On-Road Diesel Heavy Duty Vehicles	LDVs	Formaldehyde	Formaldehyde	Formaldehyde	LB	705186.2426	TON	Formaldehyde [TON]
17031	17	31	IL	Cook	Mobile - On-Road Diesel Heavy Duty Vehicles	LDVs	Benzo[a]Pyrene	Benzo[a]Pyrene (iPOM)	POM	LB	395.1257378	TON	Benzo[a]Pyrene (cPOM) [TON]
17031	17	31	IL	Cook	Mobile - On-Road Diesel Heavy Duty Vehicles	LDVs	Benzene	Benzene	Benzene	LB	1381630.356	TON	Benzene [TON]
17031	17	31	IL	Cook	Mobile - On-Road Diesel Heavy Duty Vehicles	LDVs	Acetaldehyde	Acetaldehyde	Acetaldehyde	LB	690511.9775	TON	Acetaldehyde [TON]
17031	17	31	IL	Cook	Mobile - On-Road Diesel Heavy Duty Vehicles	LDVs	Naphthalene	Naphthalene	Naphthalene	LB	111478.9019	TON	Naphthalene [TON]
17031	17	31	IL	Cook	Mobile - On-Road Diesel Heavy Duty Vehicles	LDVs	PM10 Primary (Filt + Cond)	DPM	POM	TON	395.1257378	TON	DPM [TON]

Source: EPA, 2013; Parsons, 2013

**Table 3 – Excerpt of Spreadsheet Deriving Proportional Locomotive Gaseous MSAT Emission Trends from Absolute Trends Predicted by the EPA**

[EPA420-R-08-001](#)

**Table 3-86 Control Case Air Toxic Emissions for Locomotives (short tons)**

HAP	2008	2010	2015	2020	2030	2008	2010	2015	2020	2030
BENZENE	85.5	79	61	44	27	100%	92%	71%	51%	32%
FORMALDEHYDE	1362.3	1,264	971	698	429	100%	93%	71%	51%	31%
ACETALDEHYDE	594.2	551	424	305	187	100%	93%	71%	51%	31%
1,3-BUTADIENE	99.6	92	71	51	31	100%	92%	71%	51%	31%
ACROLEIN	95.8	89	69	49	30	100%	93%	72%	51%	31%
NAPHTHALENE	44.9	40	30	21	12	100%	89%	67%	47%	27%
POM	26.8	25	20	15	8	100%	93%	75%	56%	30%

Source: EPA, 2008; Parsons, 2013

**Table 4 – Excerpt of Spreadsheet Deriving Proportional Locomotive DPM Emission Trends from Absolute PM<sub>10</sub> Emissions Trends Predicted by the EPA**

[EPA420-R-08-001](#)

**Table 3-81 Control Case PM10 Emissions for Locomotives (short tons)**

Calendar Year	Large Line-haul	Large Switch	Small Railroads	Passenger/Commuter	Total	
2006	28,477	2,304	492	1,023	32,296	
2007	28,401	2,329	500	1,011	32,241	
2008	23,287	2,019	442	822	26,569	100%
2009	22,804	2,039	449	807	26,100	98%
2010	22,248	2,019	456	774	25,498	96%
2011	21,234	2,037	464	741	24,476	92%
2012	20,203	1,987	471	701	23,362	88%
2013	18,945	1,972	469	647	22,034	83%
2014	18,313	1,928	477	611	21,329	80%
2015	17,451	1,942	481	574	20,448	77%
2016	16,329	1,891	485	532	19,237	72%
2017	15,214	1,904	490	490	18,097	68%
2018	14,363	1,883	494	448	17,188	65%
2019	13,540	1,895	498	407	16,341	62%
2020	12,938	1,798	502	375	15,613	59%
2021	12,324	1,809	507	350	14,990	56%
2022	11,675	1,752	511	325	14,263	54%
2023	11,016	1,732	515	300	13,563	51%
2024	10,367	1,655	520	275	12,817	48%
2025	9,712	1,543	524	250	12,029	45%
2026	9,091	1,505	528	227	11,351	43%
2027	8,492	1,460	533	207	10,692	40%
2028	7,915	1,412	537	188	10,053	38%
2029	7,363	1,361	542	172	9,438	36%
2030	6,844	1,305	543	157	8,849	33%
2031	6,349	1,244	544	144	8,281	31%
2032	5,879	1,179	545	132	7,735	29%
2033	5,431	1,111	546	121	7,209	27%
2034	5,026	1,040	547	111	6,723	25%
2035	4,653	969	547	101	6,270	24%
2036	4,326	897	548	93	5,864	22%
2037	4,033	840	548	86	5,508	21%
2038	3,775	801	549	81	5,205	20%
2039	3,556	761	549	76	4,941	19%
2040	3,375	720	549	72	4,717	18%

Source: EPA, 2008; Parsons, 2013

**Table 5 – Excerpt of Spreadsheet that Distills Predicted Future MSAT Emissions Quantities from an Applicable EPA Dataset and Derives Relative Emissions Trends from those Quantities**

				Emissions (ton/yr)						Proportion of 2008 Base Emissions				
				1999	2008	2010	2015	2020	2030	2008	2010	2015	2020	2030
Vehicle	Pollutant	Urban/Rural		Base	Base	Vehicle Controls	Fuel and Vehicle Controls	Fuel and Vehicle Controls	Fuel and Vehicle Controls	Base	Vehicle Control	Base	Base	Base
HDVs	1,3-Butadiene	National	HDVs: 1,3-Butadiene: National	2.67E+03	1.39E+03	1.11E+03	8.93E+02	8.67E+02	9.62E+02	100%	80%	64%	62%	69%
HDVs	Acetaldehyde	National	HDVs: Acetaldehyde: National	8.44E+03	5.39E+03	4.71E+03	4.00E+03	3.93E+03	4.42E+03	100%	87%	74%	73%	82%
HDVs	Acrolein	National	HDVs: Acrolein: National	1.54E+03	7.72E+02	6.01E+02	4.80E+02	4.70E+02	5.28E+02	100%	78%	62%	61%	68%
HDVs	Benzene	National	HDVs: Benzene: National	9.23E+03	4.92E+03	3.96E+03	2.87E+03	2.59E+03	2.61E+03	100%	81%	63%	56%	56%
HDVs	Formaldehyde	National	HDVs: Formaldehyde: National	2.52E+04	1.52E+04	1.29E+04	1.09E+04	1.07E+04	1.20E+04	100%	85%	72%	70%	79%
HDVs	Naphthalene	National	HDVs: Naphthalene: National	9.39E+02	5.51E+02	4.65E+02	2.80E+02	2.14E+02	1.91E+02	100%	84%	51%	39%	35%
HDVs	POM	National	HDVs: POM: National	1.46E+02	8.35E+01	6.96E+01	4.05E+01	3.04E+01	2.69E+01	100%	83%	49%	36%	32%
LDVs	1,3-Butadiene	National	LDVs: 1,3-Butadiene: National	2.12E+04	1.23E+04	9.67E+03	8.27E+03	7.79E+03	7.74E+03	100%	78%	80%	85%	101%
LDVs	Acetaldehyde	National	LDVs: Acetaldehyde: National	2.14E+04	1.41E+04	1.15E+04	9.97E+03	9.29E+03	9.26E+03	100%	82%	86%	92%	110%
LDVs	Acrolein	National	LDVs: Acrolein: National	2.30E+03	1.42E+03	1.14E+03	9.79E+02	9.12E+02	9.06E+02	100%	80%	82%	87%	102%
LDVs	Benzene	National	LDVs: Benzene: National	1.74E+05	1.19E+05	9.88E+04	7.62E+04	7.05E+04	7.01E+04	100%	83%	87%	90%	106%
LDVs	Formaldehyde	National	LDVs: Formaldehyde: National	5.52E+04	3.13E+04	2.40E+04	2.06E+04	1.92E+04	1.92E+04	100%	77%	80%	85%	100%
LDVs	Naphthalene	National	LDVs: Naphthalene: National	3.12E+03	2.04E+03	1.79E+03	1.74E+03	1.77E+03	2.07E+03	100%	88%	86%	87%	102%
LDVs	POM	National	LDVs: POM: National	3.51E+02	2.15E+02	1.85E+02	1.94E+02	2.09E+02	2.51E+02	100%	86%	90%	97%	117%

Source: EPA, 2005, 2006; Parsons, 2013

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([http://www.fhwa.dot.gov/environment/air\\_quality/air\\_toxics/policy\\_and\\_guidance/aqintguidmem.cfm](http://www.fhwa.dot.gov/environment/air_quality/air_toxics/policy_and_guidance/aqintguidmem.cfm))