**APPENDIX Q-3**

**COMPARISON OF AIR QUALITY ASSESSMENT VERSUS PROPERTY CHANGES**

## TECHNICAL MEMORANDUM

| | | | |
|---|---|---|---|
| To | **Kyle Stanfield, New Gold Inc.** | File no | **TC111504** |
| From | **Tony van der Vooren, AMEC** | cc | **Sheila Daniel, Dave Simms, AMEC** |
| Tel | **905-403-3536** | | |
| Date | **October 21, 2013** | | |

**Subject** **Rainy River Project: Comparison of Air Quality Assessment versus Property Changes**

### Summary

Since the completion of the Air Quality Assessment Report for the Rainy River Project (RRP) in June, 2013, Rainy River Resources / New Gold Inc. has acquired the rights to extra property and updated their operational site plan to reflect the additional site area.

Overall the changes will reduce the off-property impacts of the mining operation. The extra property provides a further buffer to the site boundary. Impacts predicted in the Air Quality Assessment Report are therefore conservative and over predict the impacts of the most recent site plan and property plan. As the impacts are reduced from the initial assessment, AMEC does not recommend reassessing the potential impacts.

The findings of the air quality assessment were as follow*:*

- *All modelled concentrations for pollutants released during the operation phase of the Project were below applicable Schedule 3 standards of O.Reg. 419 and the Ontario Ambient Air Quality Criteria (AAQC), and demonstrate that the site can operate in compliance with Ontario's regulatory requirements and guidelines; and*

- *The cumulative effect, in this case considered to be the combined effect of the background concentrations established for the vicinity of the mine and the effects predicted by the modelling, was considered for each parameter. The potential for an occasional exceedance of the $PM_{2.5}$ criteria was identified, which may occur less than one day per year. For all other contaminants, the resultant cumulative concentrations were found to be less than the respective study criterion.*

*Based upon these findings, the RRP is not expected to have a significant negative effect on local air quality.*

These conclusions do not change with the changes to the property outline.

### Discussion

There are two sets of figures attached to this technical memorandum. The first set is the isopleths for the key contaminants from the Air Quality Quality Assessment. The second set is for the revised site boundaries and site plan, but with the original isopleths. These follow the same number of the original isopleths, but with 'M' preceding the figure number. For example the Total Particulate figure in the Air Quality study is Figure 7-1a. In the second set with the

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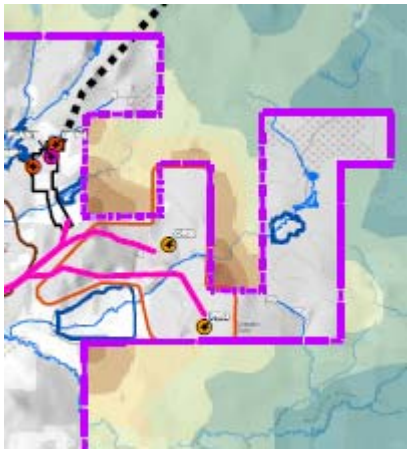
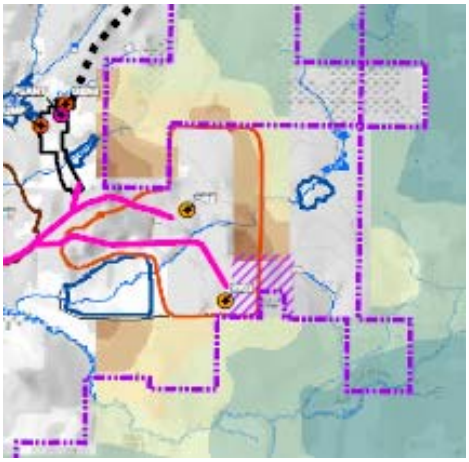
modified site and boundary plans, the equivalent Total Particulate figure is Figure M7.1a. The second set shows isopleths within the new site boundary (i.e. the original receptors), to demonstrate the differences with the new site boundary.

Key conclusions from comparing the two sets of isopleths are:

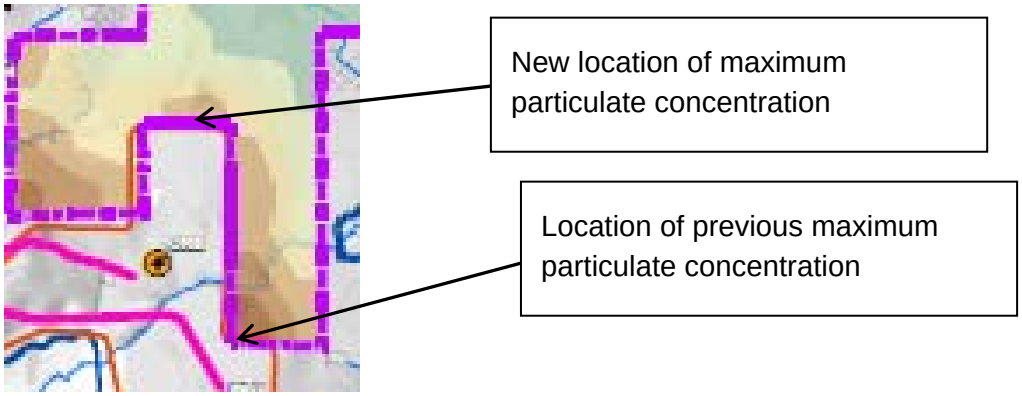
1. The areas immediately to the east and south of the eastern mine rock pile, are now part of the property. Particulate impacts of the east mine rock pile are now substantially less at these off-property locations and boundaries. The following two images of the particulate figures, show the original site boundary and the new boundary.



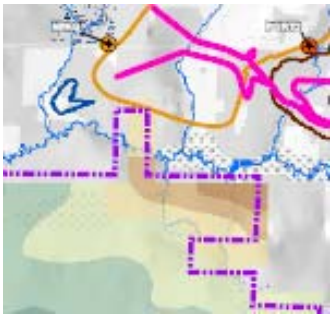


Although the mine rock pile footprint has changed (i.e. moved further east), the modelled impacts to the east and south show significant reductions at the new property boundary. The reduction to the east and south is about 20 to 30 ug/m$^3$. Impacts to the north of the mine rock pile remain unchanged.

The overall maximum for the assessment also changed as a result of the changed plans. In the original assessment, the maximum impact was found at the property boundary shown in the image below. The maximum predicted level for total particulate was 86 ug/m$^3$. With the revised property boundary, the maximum now occurs to the north of the mine rock pile. The predicted maximum for this location is about 75 ug/m$^3$.

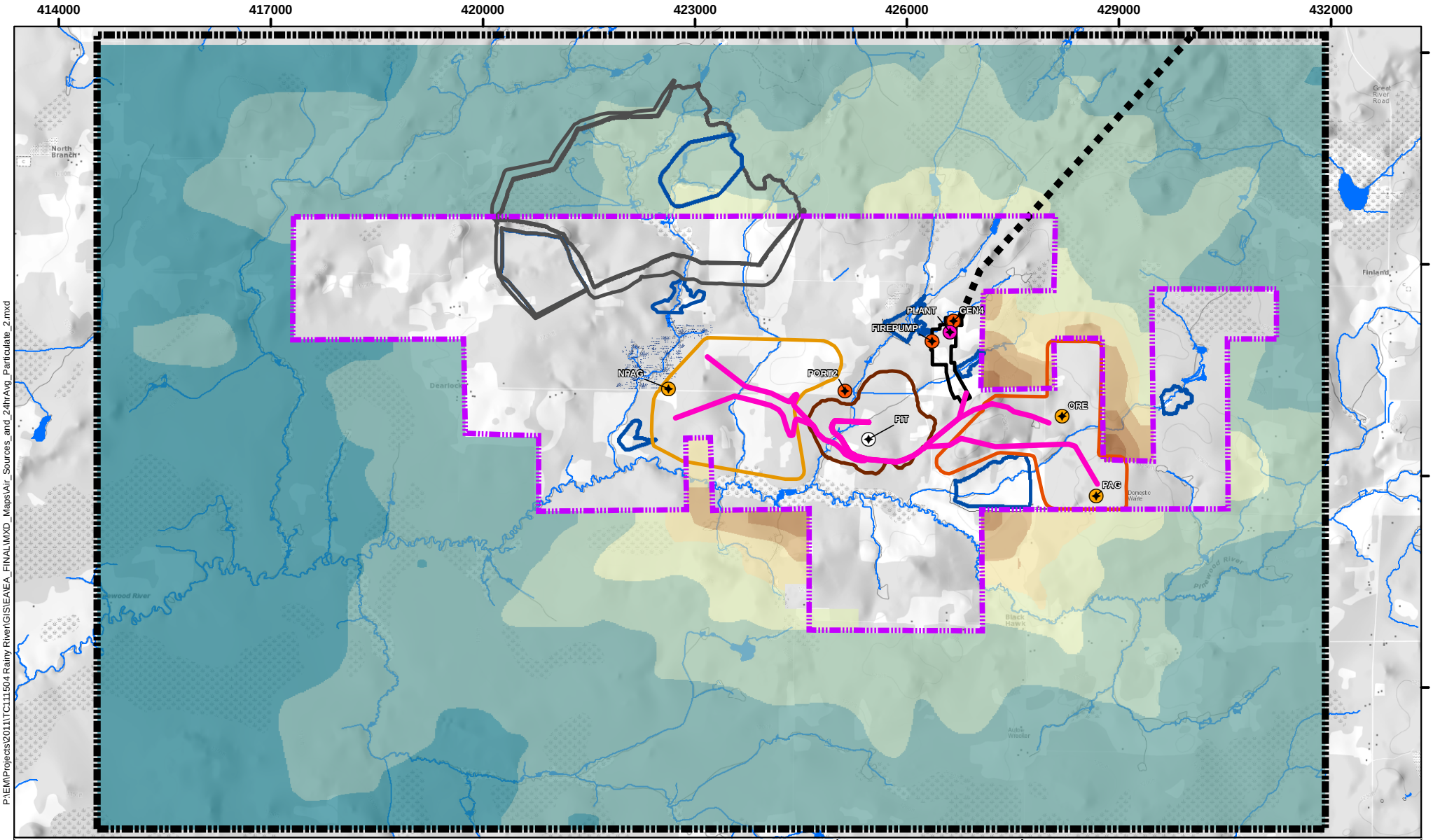


2. There is also a change in footprint for the west mine rock stockpile. In the original assessment, a portion of the mine rock pile was shown to extend slightly off-property. At the time, it was assumed that property would be acquired. This has not occurred, and the mine rock pile has been slightly relocated to ensure the stockpile remains on-site. This is shown in the following two images for the particulate modelling. The activity is now further from the site boundary and will reduce the potential particulate levels at the boundary.



3. The effects of the change in site plan and property boundary are most noticeable in the particulate isopleths. There are off-site reductions as well for $NO_x$, hydrogen cyanide and $SO_2$, but these are not as significant due to the location of the primary sources for those compounds. The maximum locations have not changed from the previous assessment.

Overall, the increased site area has provided extra distance to the off-property receptors, reducing the potential off-property air quality impacts. Changes to the site plan have not caused any differences to modelling assumptions or approach. The original modelling, impact assessment and conclusions are still valid.




## LEGEND

**Modelling Property Extent**

**Sources (labelled with ID)**

- Area
- Open Pit
- Point
- Volume
- Line Source (haul roads)

**Proposed Site Features**

- Open Pit (Feb. 2013)
- Tailings Management Area
- Overburden / West Mine Rock Stockpile (Feb. 2013)
- Ore / East Mine Rock Stockpile (Feb. 2013)
- Plant Site / Ancillary Facilities
- Ponds
- Transmission Line

**Total Particulate – 24 hour average * Concentrations in ug/m$^3$**

- 5 - 10
- 10 - 20
- 20 - 30
- 30 - 40
- 40 - 50
- 50 - 60
- 60 - 70
- 70 - 80

NOTES:
* Standard is 120 ug/m$^3$

0 1.25 2.5 5 7.5 10 Kilometres

Datum: NAD83
Projection: UTM Zone 15N

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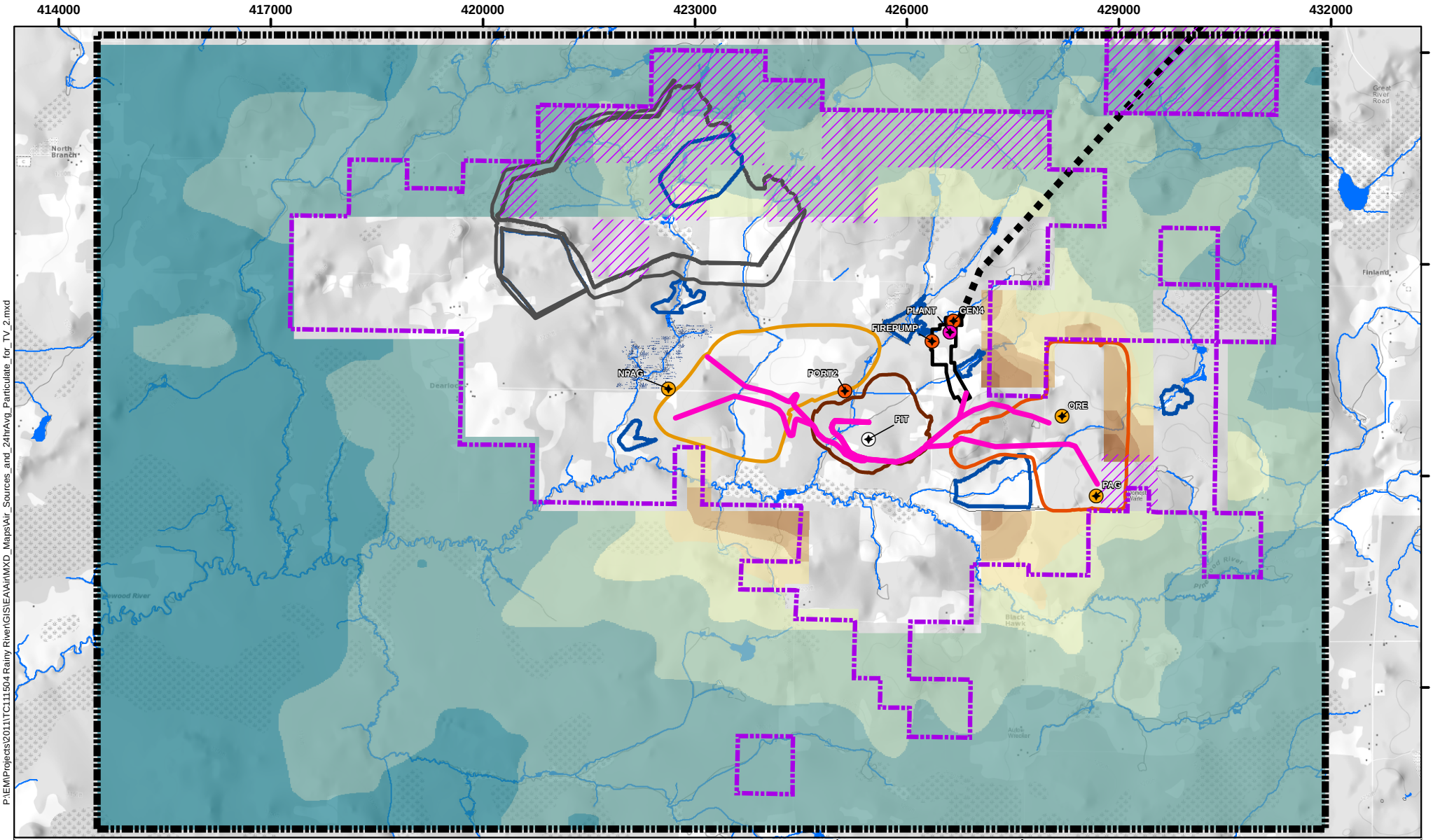
# RAINY RIVER PROJECT

## Modelled Total Particulate Emissions

| | |
|---|---|
| PROJECT N$^o$: TC111504 | **FIGURE: 7-1a** |
| SCALE: 1:75,000 | DATE: October 2013 |

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## LEGEND

- RRR Property Boundary
- Area to be brought to Lease

**Sources (labelled with ID)**

- Area
- Open Pit
- Point
- Volume
- Line Source (haul roads)

**Proposed Site Features**

- Open Pit (Sept. 2013)
- Tailings Management Area
- Overburden / West Mine Rock Stockpile (Sept. 2013)
- Ore / East Mine Rock Stockpile (Sept. 2013)
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- Ponds
- Transmission Line

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- 5 - 10
- 10 - 20
- 20 - 30
- 30 - 40
- 40 - 50
- 50 - 60
- 60 - 70
- 70 - 80

NOTES:
* Standard is 120 ug/m$^3$

0 1.25 2.5 5 7.5 10 Kilometres

Datum: NAD83
Projection: UTM Zone 15N

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**RAINY RIVER PROJECT**

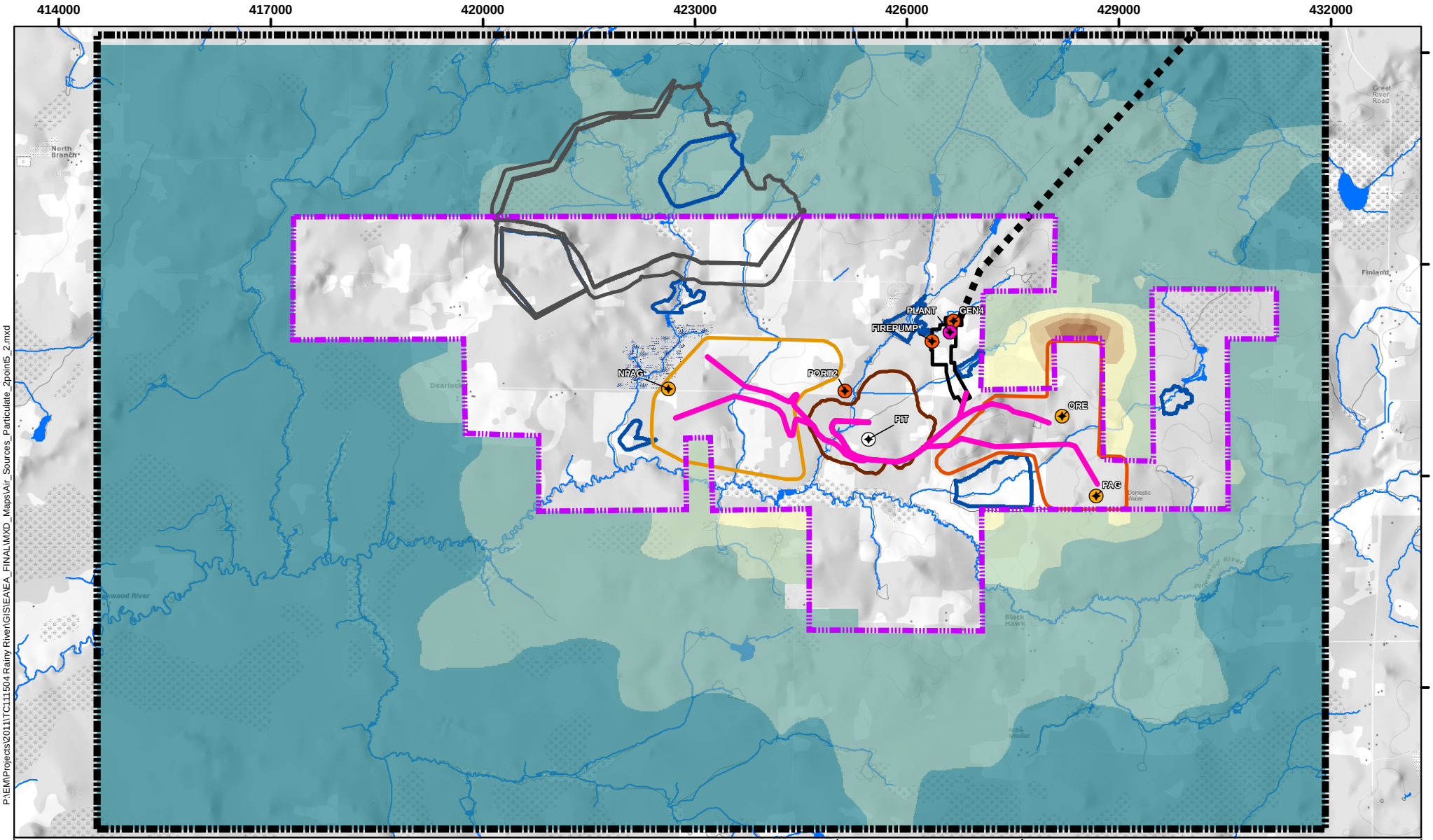
**Modelled Total Particulate Emissions**

PROJECT N$^o$: TC111504

**FIGURE: M7-1a**

SCALE: 1:75,000

DATE: October 2013

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## LEGEND

- Modelling Property Extent

**Sources (labelled with ID)**

- Area
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- Point
- Volume
- Line Source (haul roads)

**Proposed Site Features**

- Open Pit (Feb. 2013)
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- Ore / East Mine Rock Stockpile (Feb. 2013)
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- Ponds
- Transmission Line

**$PM_{2.5}$ – 24 hour average * Concentrations in ug/m$^3$**

- 1.06 - 3
- 3 - 6
- 6 - 9
- 9 - 12
- 12 - 15
- 15 - 18
- 18 - 21

NOTES:
* Ambient air quality criterion is 25 ug/m$^3$

Datum: NAD83
Projection: UTM Zone 15N

0 1.25 2.5 5 7.5 10 Kilometres

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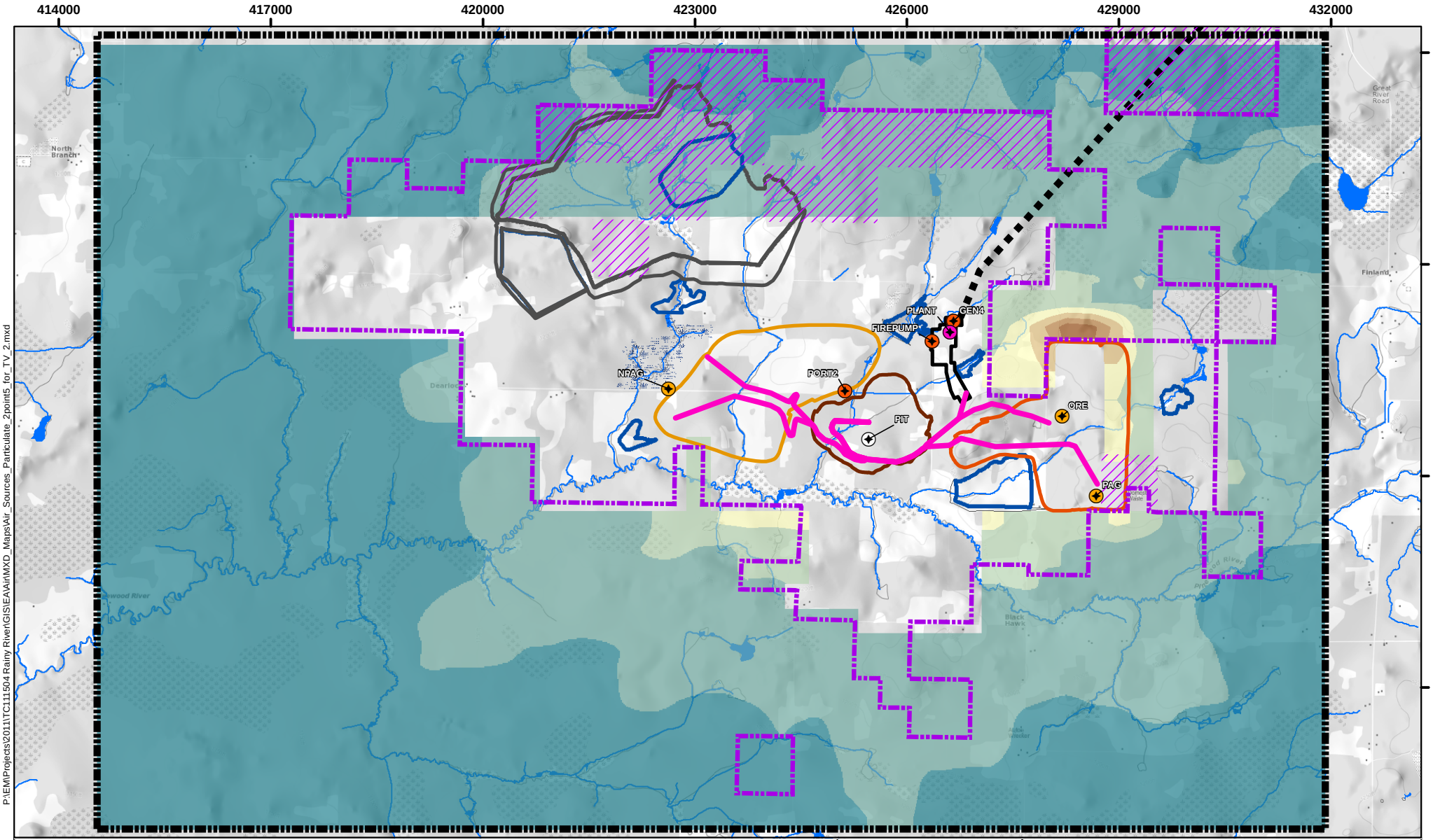
## Modelled $PM_{2.5}$ Emissions

PROJECT N$^o$: TC111504 | **FIGURE: 7-1b**

SCALE: 1:75,000 | DATE: October 2013

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## LEGEND

- RRR Property Boundary
- Area to be brought to Lease

**Sources (labelled with ID)**

- Area
- Open Pit
- Point
- Volume
- Line Source (haul roads)

**Proposed Site Features**

- Open Pit (Sept. 2013)
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**$PM_{2.5}$ – 24 hour average * Concentrations in ug/m$^3$**

- 1.06 - 3
- 3 - 6
- 6 - 9
- 9 - 12
- 12 - 15
- 15 - 18
- 18 - 21

NOTES:
* Ambient air quality criterion is 25 ug/m$^3$

0 1.25 2.5 5 7.5 10 Kilometres

Datum: NAD83
Projection: UTM Zone 15N

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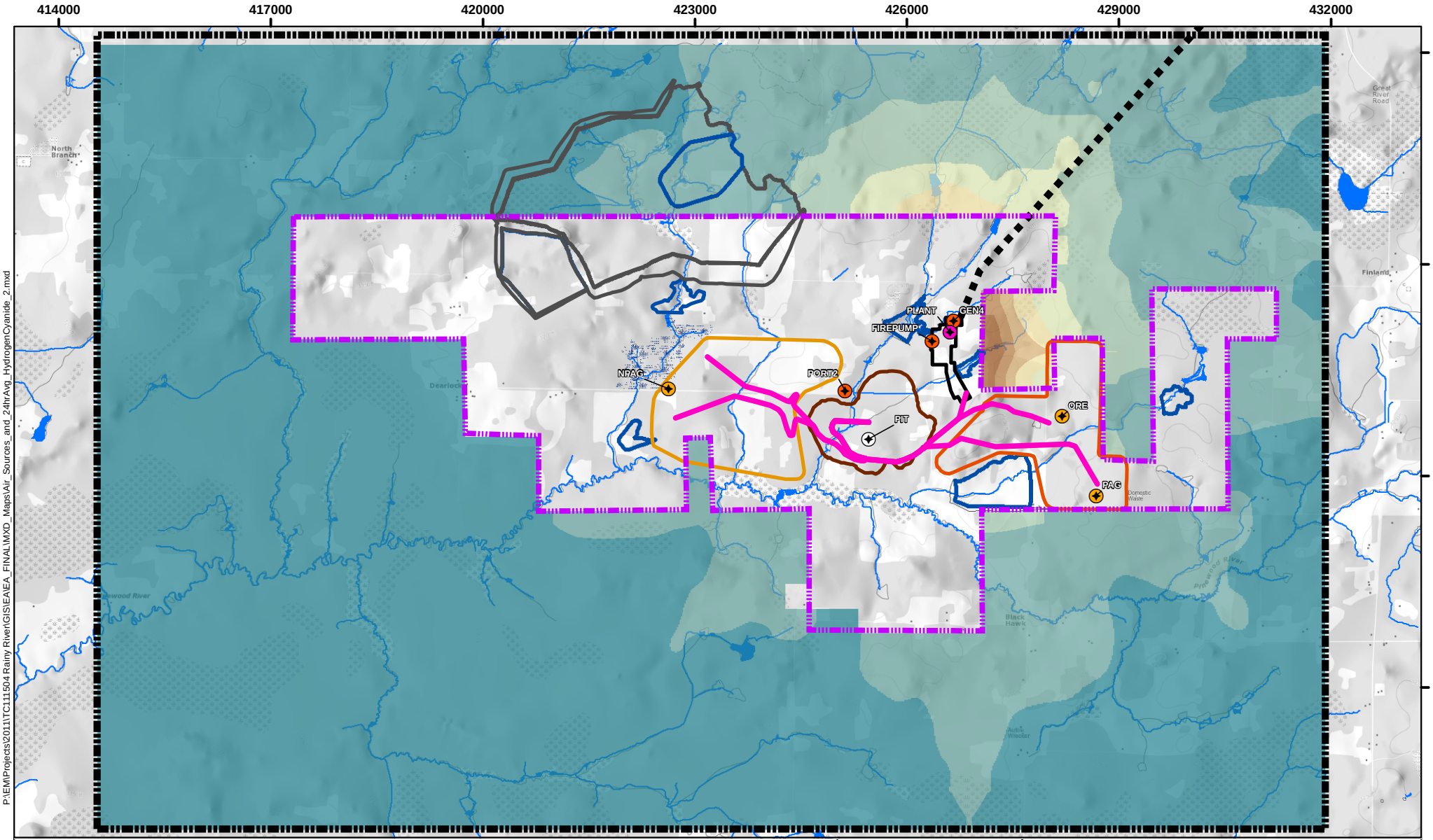
## Modelled $PM_{2.5}$ Emissions

| | |
|---|---|
| PROJECT N$^o$: TC111504 | **FIGURE: M7-1b** |
| SCALE: 1:75,000 | DATE: October 2013 |




## LEGEND

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- Area
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- Point
- Volume
- Line Source (haul roads)

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- Transmission Line

**Hydrogen Cyanide – 24 hour average* Concentrations in ug/m$^3$**

- 0.04 - 0.2
- 0.2 - 0.4
- 0.4 - 0.6
- 0.6 - 0.8
- 0.8 - 1
- 1 - 1.2
- 1.2 - 1.4
- 1.4 - 1.6

NOTES:
* Standard is 8 ug/m$^3$

0 1.25 2.5 5 7.5 10 Kilometres

Datum: NAD83
Projection: UTM Zone 15N

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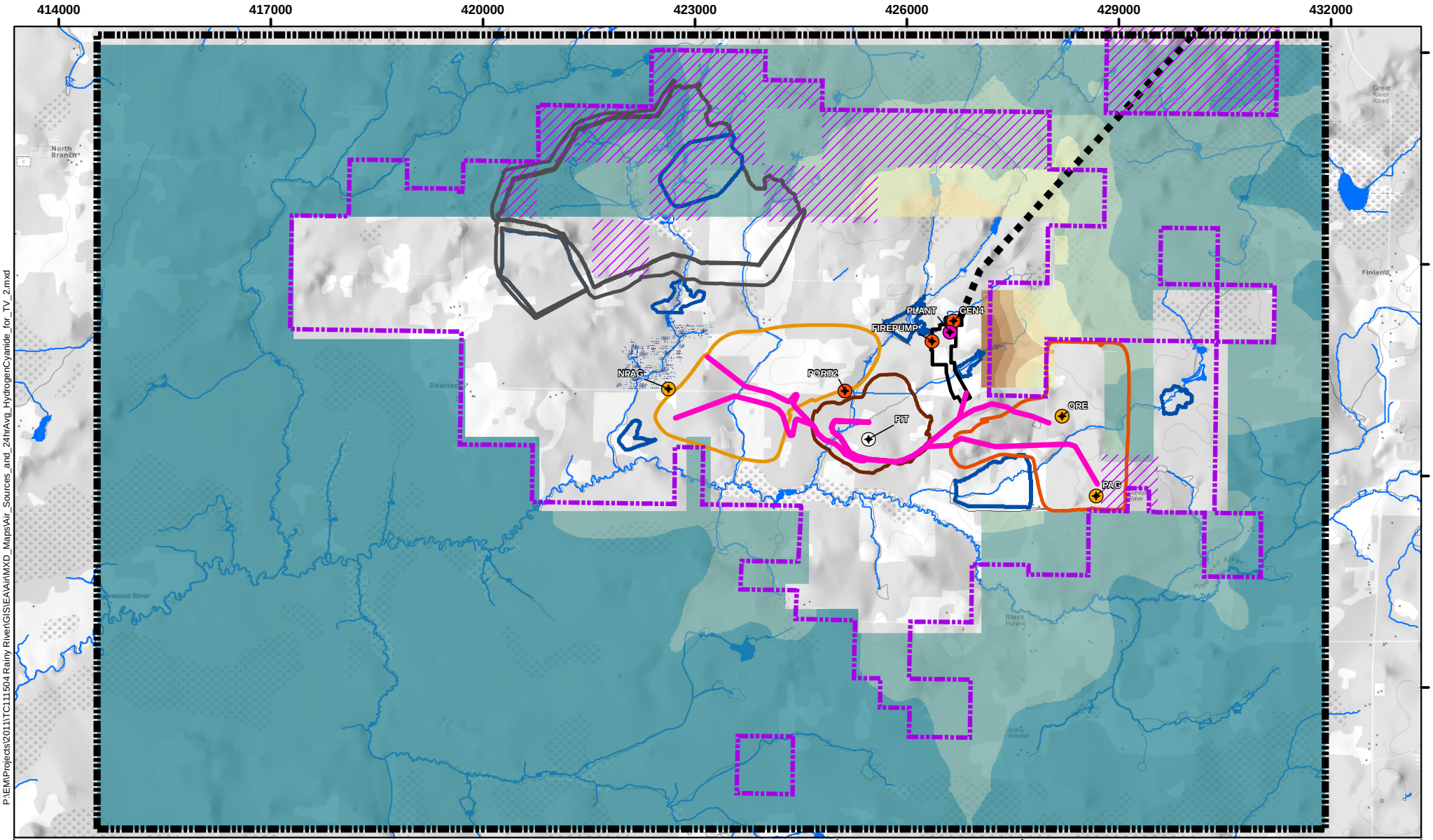
## Modelled Hydrogen Cyanide Emissions

| | |
|---|---|
| PROJECT N$^o$: TC111504 | **FIGURE: 7-2** |
| SCALE: 1:75,000 | DATE: October 2013 |

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- 0.4 - 0.6
- 0.6 - 0.8
- 0.8 - 1
- 1 - 1.2
- 1.2 - 1.4
- 1.4 - 1.6

NOTES:
* Standard is 8 ug/m$^3$

0 1.25 2.5 5 7.5 10 Kilometres

Datum: NAD83
Projection: UTM Zone 15N

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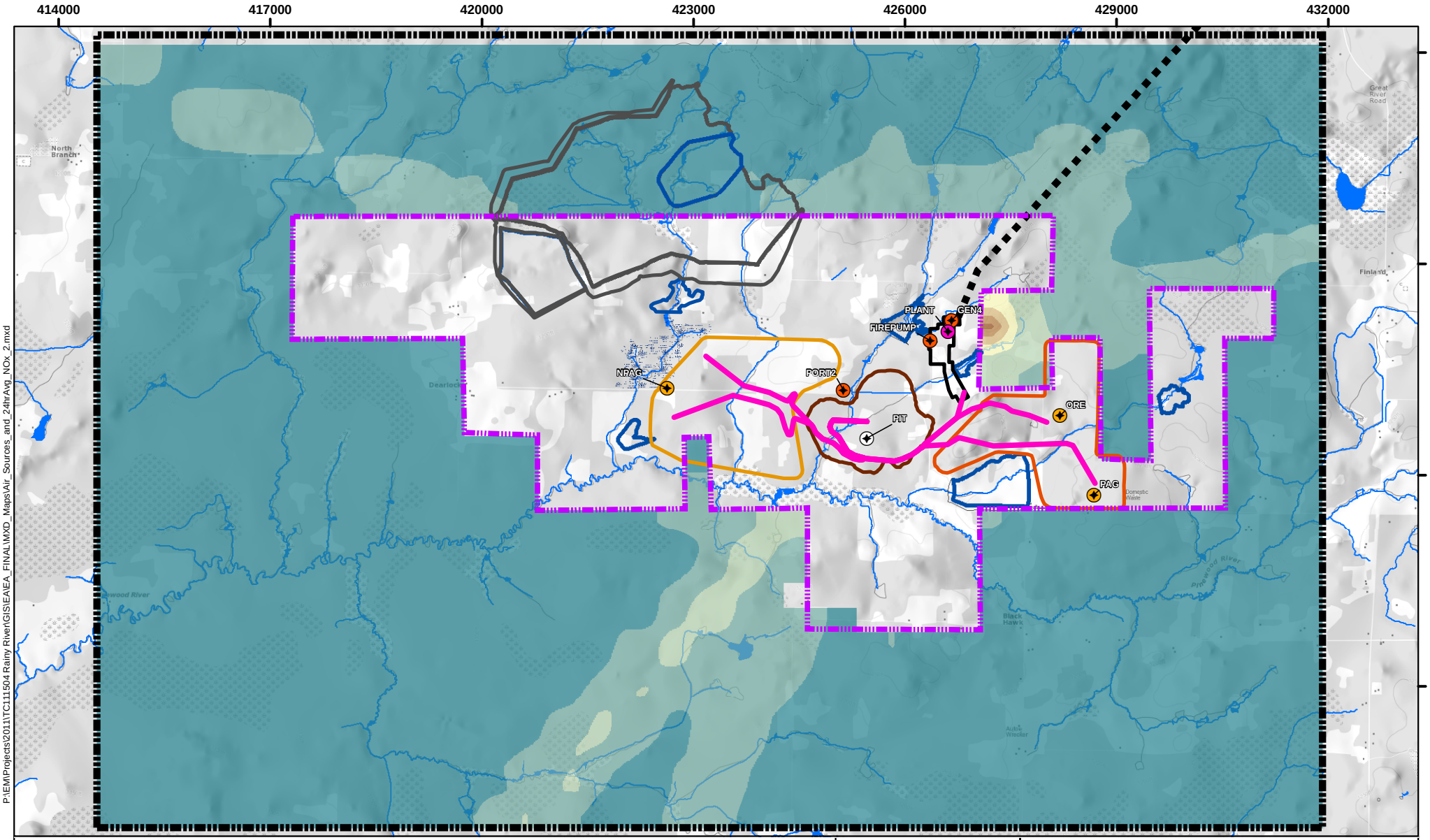
# RAINY RIVER PROJECT

## Modelled Hydrogen Cyanide Emissions

| | |
|---|---|
| PROJECT N$^o$: TC111504 | **FIGURE: M7-2** |
| SCALE: 1:75,000 | DATE: October 2013 |




## LEGEND

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- Volume
- Line Source (haul roads)

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- Ponds
- Transmission Line

**Nitrogen Oxides – 24 hour average* Concentrations in ug/m$^3$**

- 0.59 - 4
- 4 - 8
- 8 - 12
- 12 - 16
- 16 - 20
- 20 - 24
- 24 - 28

NOTES:
* Standard is 200 ug/m$^3$

0 1.25 2.5 5 7.5 10 Kilometres

Datum: NAD83
Projection: UTM Zone 15N

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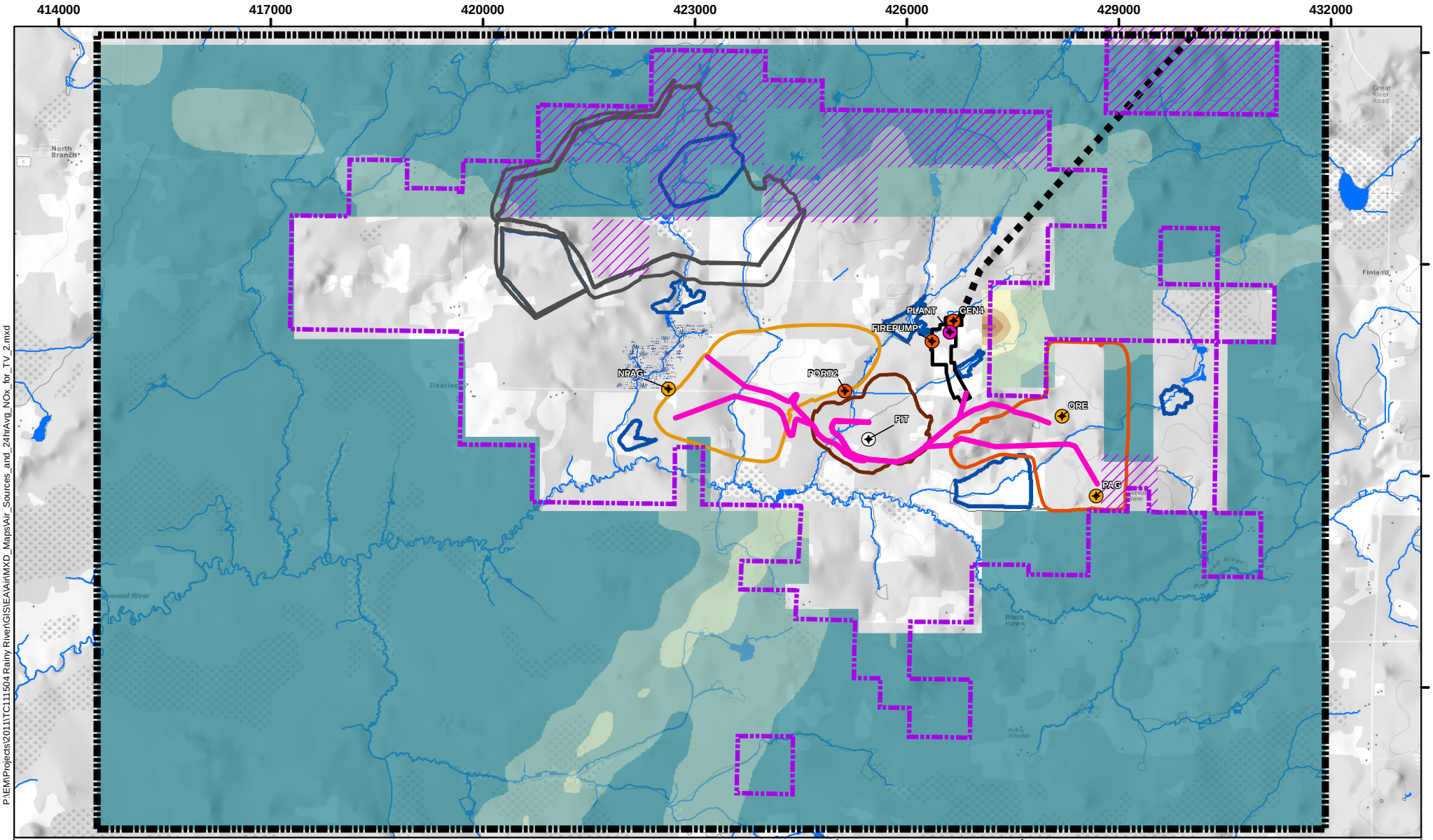
## Modelled Nitrogen Oxides Emissions - 24 Hour Average

| | |
|---|---|
| PROJECT N$^o$: TC111504 | **FIGURE: 7-3** |
| SCALE: 1:75,000 | DATE: October 2013 |

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- 4 - 8
- 8 - 12
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- 16 - 20
- 20 - 24
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NOTES:
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0 1.25 2.5 5 7.5 10 Kilometres

Datum: NAD83
Projection: UTM Zone 15N

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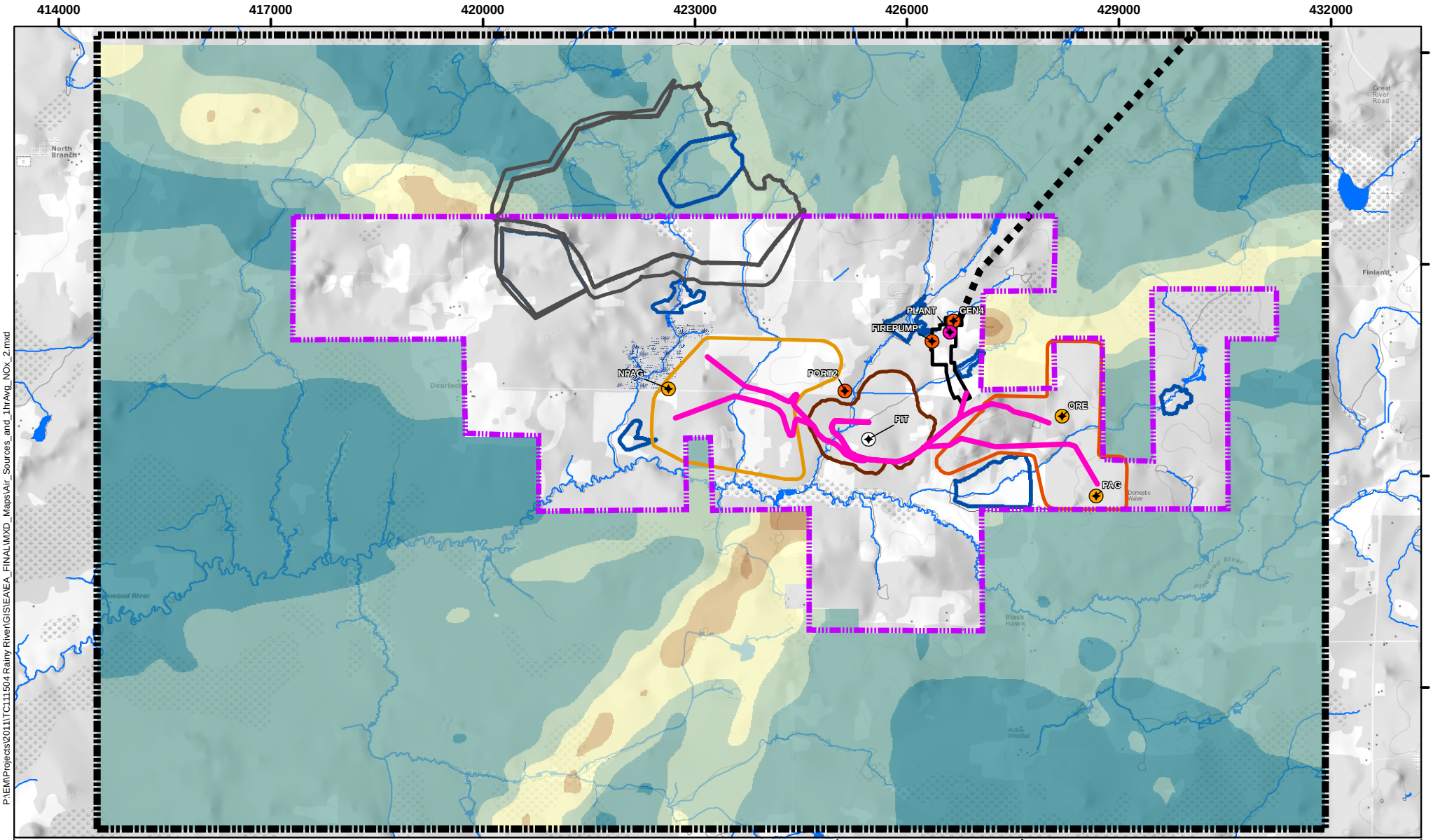
## Modelled Nitrogen Oxides Emissions - 24 Hour Average

| | |
|---|---|
| PROJECT N$^o$: TC111504 | **FIGURE: M7-3** |
| SCALE: 1:75,000 | DATE: October 2013 |




## LEGEND

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- Transmission Line

**Nitrogen Oxides – 1 hour average* Concentrations in ug/m$^3$**

- 9.4 - 35
- 35 - 70
- 70 - 105
- 105 - 140
- 140 - 175
- 175 - 210
- 210 - 245

NOTES:
* Standard is 400 ug/m$^3$

0 1.25 2.5 5 7.5 10 Kilometres

Datum: NAD83
Projection: UTM Zone 15N

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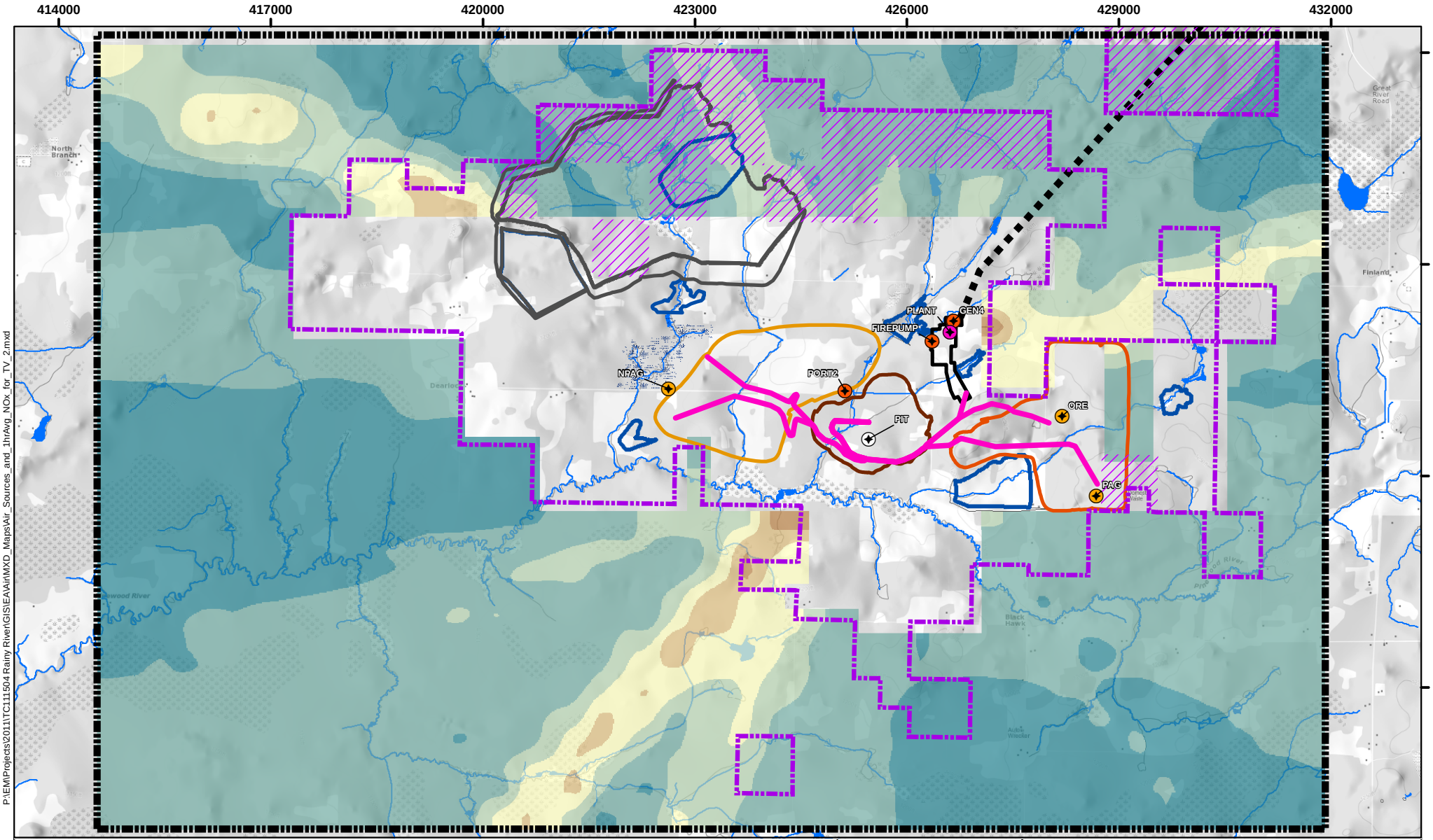
# RAINY RIVER PROJECT

## Modelled Nitrogen Oxides Emissions - 1 Hour Average

| | |
|---|---|
| PROJECT N$^o$: TC111504 | **FIGURE: 7-4** |
| SCALE: 1:75,000 | DATE: October 2013 |

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## LEGEND

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- 9.4 - 35
- 35 - 70
- 70 - 105
- 105 - 140
- 140 - 175
- 175 - 210
- 210 - 245

NOTES:
* Standard is 400 ug/m$^3$

0 1.25 2.5 5 7.5 10 Kilometres

Datum: NAD83
Projection: UTM Zone 15N

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# RAINY RIVER PROJECT

## Modelled Nitrogen Oxides Emissions - 1 Hour Average

| | |
|---|---|
| PROJECT N$^o$: TC111504 | **FIGURE: M7-4** |
| SCALE: 1:75,000 | DATE: October 2013 |