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# NETL Life Cycle Inventory Data

## Process Documentation File

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### Section II: Process Description

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#### Associated Documentation

This unit process is composed of this document and the data sheet (DS) *DS\_Stage1\_C\_Track Loader\_239\_HP\_2010.01.xls*, which provides additional details regarding relevant calculations, data quality, and references.

#### Goal and Scope

The scope of this unit process covers the materials required for the construction of a single, 239 HP track loader used to scrape and push unconsolidated overburden at a large scale surface mine, as described below. The track loader is assumed to be composed entirely of steel plate. The process is based on the reference flow of 1 piece of track loader, as described below and shown in **Figure 1**.

This unit process is used under Life Cycle (LC) Stage #1 to assist in the movement of overburden at the mine site. It is combined with other relevant equipment for LC Stage #1 in a separate construction assembly process, *DF\_Stage1\_C\_Assembly\_PRB\_Coal\_Surface\_Mine\_2010.01.doc*. The assembly process quantifies the fraction of each piece of equipment needed under LC Stage #1 to produce 1 kg of coal.

#### Boundary and Description

The total weight for one empty track loader was estimated to be 26,373 kg (58,142 lbs). This figure represents manufacturer specifications for the weight of a Caterpillar model 973C track loader (Caterpillar 2008). The total weight of a track loader was readily available from published sources, but only minimal data for the material breakdown of a loader were found. Therefore, the track loader is assumed to be composed entirely of steel plate, according to the amount indicated above.

**Figure 1** provides an overview of the boundary of this unit process. Emissions related to the physical assembly of the track loader (e.g., emitted while assembling the components of a loader, including transport of those components) are not considered in this study. Upstream emissions from the production of raw materials used for the construction of the loader (e.g., steel plate) are calculated outside of the boundary of this unit process, based on proprietary profiles available within the GaBi model. As shown in Figure 1 and discussed above, the loader constructed in this unit process is incorporated into the assembly process for a large surface coal mine under LC Stage #1.

**Table 1** summarizes the relevant properties and assumptions used to calculate the amount of steel plate contained in a single track loader. **Table 2** provides a summary of modeled input and output flows. Additional detail regarding input and output flows, including calculation methods, is contained in the associated DS.

Figure 1: Unit Process Scope and Boundary

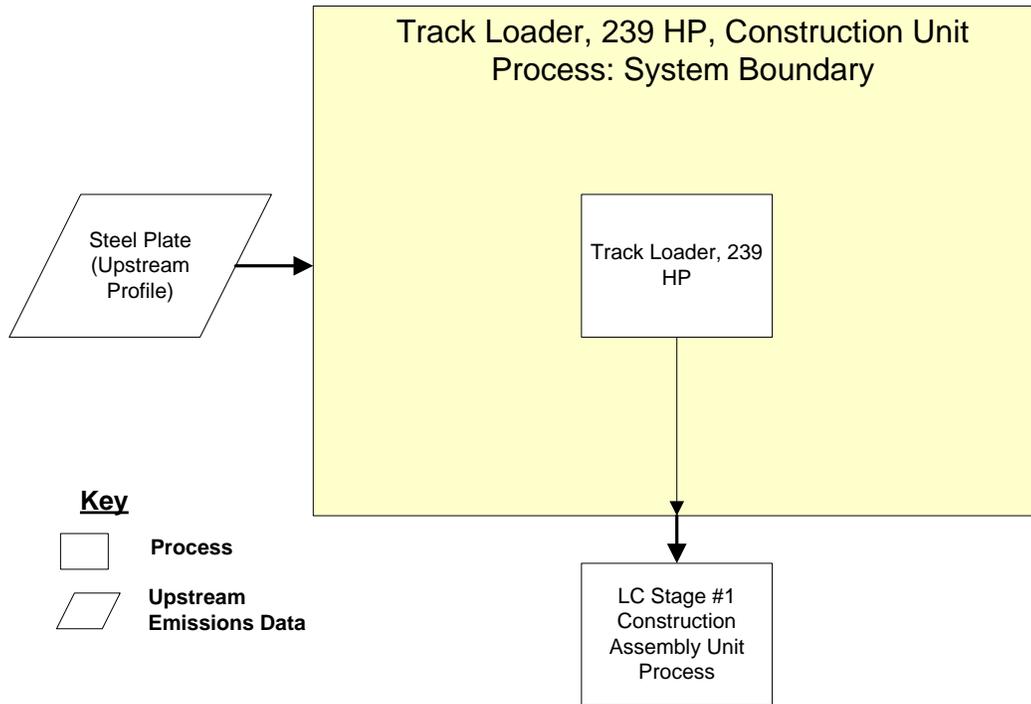


Table 1: Properties of a Single Track Loader

Material Composition and Weights		
Material	Weight	Reference
Average Weight of 1 Loader, kg (lbs)	26,373 (58,142)	Caterpillar 2008
Steel Plate, kg (lbs)	26,373 (58,142)	NETL Engineering Calculation

Table 2: Unit Process Input and Output Flows

Flow Name	Value	Units (Per Reference Flow)
<b>Inputs</b>		
<b>Steel Plate, BF (85% Recovery Rate) [Metals]</b>	<b>26,372.77</b>	<b>kg</b>
<b>Outputs</b>		
Track Loader, 239 HP [Construction]	1	pcs

\* **Bold face** clarifies that the value shown *does not* include upstream environmental flows. Upstream environmental flows were added during the modeling process using GaBi modeling software, as shown in Figure 1.

### Embedded Unit Processes

None.

### References

Caterpillar 2008

Caterpillar. 2008. *973C Track Loader*. Caterpillar. <http://www.cat.com/cmms/images/C453359.pdf> (Accessed December 18, 2009).

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### Section III: Document Control Information

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Original/no revisions

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**Section IV: Disclaimer**

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