## **Accepted Manuscript**

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PII: \$0959-6526(15)00990-7

DOI: 10.1016/j.jclepro.2015.07.062

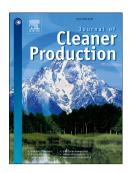
Reference: JCLP 5869

To appear in: Journal of Cleaner Production

Received Date: 1 April 2015
Revised Date: 2 June 2015
Accepted Date: 10 July 2015

Please cite this article as: Chen W, Zhang F, Hong J, Shi W, Feng S, Tan X, Geng Y, Life cycle toxicity assessment on deep-brine well drilling, *Journal of Cleaner Production* (2015), doi: 10.1016/j.jclepro.2015.07.062.

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#### ACCEPTED MANUSCRIPT

Life cycle toxicity assessment on deep-brine well drilling

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#### **ABSTRACT**

The features of a life cycle toxicity assessment (LCTA) model include

regionalization, uncertainties, and geographical variability. This study provides a

simplified and regionalized LCTA to improve the evaluation of regional toxicity

impact based on a case study of deep-brine well drilling in China. Uncertainty

analysis was conducted using Taylor series expansions. The proposed LCTA can

efficiently quantify the toxicity impact and identify its key contributing factors.

Results show that the key factors contributing to the toxicity impact of deep-brine

well drilling are steel, electricity, and direct pollutant emissions generated from fluid

loss and waste (i.e., waste drilling fluid and drilling cuttings) disposal during drilling.

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