

**Joint UNEP/OCHA Environment Unit**  
**Environmental Risk Identification**  
*Hurricane Dean Belize - 20 August 2007*

Disclaimer

*This profile is not a conclusive list. Other risks may be possible from sources that are not readily identifiable. The information sources used are public websites. All efforts are made to screen the websites for accuracy.*

**Objective:**

The objective of the Environmental Risk Identification (ERI) is to alert the UN Country Team after the natural disaster to potential secondary risks posed by large infrastructure and industrial facilities containing hazardous materials located in the affected area. This information can be shared with competent local and national authorities as appropriate. Any actual secondary risk should be addressed at the earliest possible stage.

**Event:** Hurricane Dean is expected to make landfall in Belize.

**Summary of findings:**

The following large infrastructure and industrial facilities may pose a risk:

Facility	Location	Hazardous material	Hazard
<b>Large infrastructure</b>			
<b>Large hydro dams</b>			
Chalillo hydropower project	Upper Macal River, Cayo district	.-.	Dam stability might be affected, dammed water, high voltage electricity
<b>Mining activities</b>			
Alluvial gold mining	Ceibo Chico Creek area, Chiquibul Forest	Mercury, Cyanide, Arsenic	Liquid toxic/persistent
<b>General risks of mining activities:</b>			
<i>Possible type of incident</i>	<i>Typical cause of accidents possibly aggravated by the floods</i>		<i>Potential effects</i>
Transport of chemicals to/from site	Inadequate transport procedures and equipment, unsafe packaging, high-risk transportation routes		Contamination of soil, water, effects on water users, aquatic ecosystem damage, threat to human health
Ground substance	Slope failure, breakthrough to surface		Loss of life, damage to property
<b>Oil and Gas infrastructure</b>			
Mainly exploration, some exploitation (2,000barrels/day)	Cayo and Orange districts, possibly others	Gasoline, naphta, hydrofluoric acid, propane, butane, ethylene, propylene, mercaptan, liquefied natural gas and other combustibles	Corrosive, Flammable, Toxic
<b>Electric power stations</b>			
Thermal		Ammonia (cooling), Fuel	Toxic Gas, Flammable
<b>Agro/Food Industry</b>			
Sugar Industry	Sugar is an expert product. No specific site locations could be identified.	Sulphur dioxide	Toxic gas
<b>Public Areas and Services</b>			
Hospitals	No specific site	Mercury, radioactive	Toxic, Radioactive,

	locations could be identified.	sources, solvents, compressed gases, infectious substances, oxygen, ethylene oxide and various solvents	Flammable, Infectious
Drinking Water Filtration plant	No specific site locations could be identified.	Chlorine, hypochlorite solutions, acids	Corrosive, Toxic gas, Oxidizing
Sewage Treatment plant	No specific site locations could be identified.	Chlorine, hydrogen peroxide	Toxic, Corrosive, Oxidizing
<b>Specific Basic Industry</b>			
Clothing	Textile is an expert product. No specific site locations could be identified.	Benzene, naphtalene, acids, alkalis, chlorine, bromine, sodium nitrate, ammonia, sodium sulphide, metals, lye, dyes, solvents, formic acid	Flammable, Toxic, Corrosive, Oxidizing

**The Joint UNEP/OCHA Environment Unit :**

The Joint UNEP/OCHA Environment Unit is the United Nations mechanism to mobilize and coordinate the international response to environmental emergencies caused by natural disaster, technological accidents and complex emergencies.

**Information sources:**

Infrastructure Risks	Source of information
Nuclear Facilities	<ul style="list-style-type: none"> <li>• <a href="http://www.iaea.org/programmes/a2/index.html">http://www.iaea.org/programmes/a2/index.html</a></li> <li>• <a href="http://www-pub.iaea.org/MTCD/publications/PDF/cnpp2003/CNPP_Webpage/pages/countryprofiles.htm">http://www-pub.iaea.org/MTCD/publications/PDF/cnpp2003/CNPP_Webpage/pages/countryprofiles.htm</a></li> <li>• <a href="http://www.iaea.org/worldatom/rrdb/">http://www.iaea.org/worldatom/rrdb/</a></li> <li>• <a href="http://www.grid.unep.ch/data/download/gnv181.gif">http://www.grid.unep.ch/data/download/gnv181.gif</a></li> <li>• <a href="http://www.worldenergy.org/wec-geis/publications/reports/ser/nuclear/nuclear.asp">http://www.worldenergy.org/wec-geis/publications/reports/ser/nuclear/nuclear.asp</a></li> </ul>
Large hydrodams.	<ul style="list-style-type: none"> <li>• <a href="http://www.worldenergy.org/wec-geis/publications/reports/ser/hydro/hydro.asp">http://www.worldenergy.org/wec-geis/publications/reports/ser/hydro/hydro.asp</a></li> </ul>
Large Chemical/Industrial Industries	<ul style="list-style-type: none"> <li>• <a href="http://www.pops.int/documents/implementation/nips/submissions/default.htm">http://www.pops.int/documents/implementation/nips/submissions/default.htm</a></li> <li>• <a href="http://www.chem.unep.ch/pops/pcdd_activities/inventories/default.htm">http://www.chem.unep.ch/pops/pcdd_activities/inventories/default.htm</a></li> </ul>
Gas/Oil: Refineries, Pipelines, explorations sites	<ul style="list-style-type: none"> <li>• <a href="http://www.eia.doe.gov/emeu/cabs/index.html">http://www.eia.doe.gov/emeu/cabs/index.html</a></li> <li>• <a href="http://www.worldenergy.org/wec-geis/publications/reports/ser/gas/gas.asp">http://www.worldenergy.org/wec-geis/publications/reports/ser/gas/gas.asp</a></li> <li>• <a href="http://www.lib.utexas.edu/maps/map_sites/oil_and_gas_sites.html">http://www.lib.utexas.edu/maps/map_sites/oil_and_gas_sites.html</a></li> </ul>
Mining activities	<ul style="list-style-type: none"> <li>• <a href="http://www.worldenergy.org/wec-geis/publications/reports/ser/coal/coal.asp">http://www.worldenergy.org/wec-geis/publications/reports/ser/coal/coal.asp</a></li> <li>• <a href="http://www.worldenergy.org/wec-geis/publications/reports/ser/uranium/uranium.asp">http://www.worldenergy.org/wec-geis/publications/reports/ser/uranium/uranium.asp</a></li> <li>• <a href="http://minerals.usgs.gov/minerals/pubs/country/2005/mzmyb05.pdf">http://minerals.usgs.gov/minerals/pubs/country/2005/mzmyb05.pdf</a></li> <li>• <a href="http://www.camec-plc.com/Investors_Media/RNS/2004/rns_025.php">http://www.camec-plc.com/Investors_Media/RNS/2004/rns_025.php</a></li> </ul>
Hazardous waste storage sites	<ul style="list-style-type: none"> <li>• <a href="http://www.basel.int/natreporting/compilations.html">http://www.basel.int/natreporting/compilations.html</a></li> </ul>

- Conseil pour la réduction des accidents industriels majeurs (CRAIM). *Risk Management Guide for Major Industrial Accidents intended for municipalities and industry*. 2002 Edition.
- International Atomic Energy Agency (IAEA). *Manual for the classification and prioritisation of risks due to major accidents in process and related industries. Inter-agency Programme on the Assessment and Management for Health and Environmental Risks from Energy and other Complex Industrial Systems*. 1996.
- UNEP Industry and Environment (IE). *Hazard Identification and evaluation in a local community. Technical report n°12*. 1998.
- UNDAC *Field Handbook*
- *Emergency Response guidebook 2004. A guidebook for first responders during the initial phase of a dangerous goods/hazardous materials incident*.
- UNEP. *APELL for Mining. Guidance for the Mining industry in raising awareness and preparedness for emergencies at local level. Technical report N°41*. 2001

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