The purpose of this information sheet is to provide general information about uranium, its natural occurrence and its occurrence at the Hillside Project. Over the course of Rex Minerals Ltd (Rex) developing the Hillside Copper Mine on the Yorke Peninsula (YP) questions have arisen in the community about uranium, in particular how much is at Hillside and is it safe for the public, workers and the environment.

Uranium is a naturally occurring metallic element that has always been present, since the formation of the earth. It is a fairly common element in soil, rock and in sea and groundwater. Uranium is a radioactive material and it releases radiation when it undergoes a process called radioactive decay. The radiation that we are exposed to from sources like soil, water and food is referred to as background radiation. Concentrations of background radiation can vary considerably from place to place, depending on local geology and other factors.

Uranium grades are expressed as a ratio as “parts-per-million” (ppm). For example 10,000 represents 1% of one million, 10,000 ppm is equal to 1%. In South Australia the regulatory limit is set by the Environmental Protection Agency (EPA) and is equivalent to 200 ppm uranium. When material is over this 200 ppm limit, regulatory controls require management strategies such as blending material to below this level to ensure worker and community safety at all times.

The average uranium grade of the material to be mined at Hillside is 55.9 ppm, well below the level for classification as a radioactive material of 200 ppm and consequently, worker and public doses will be very low.

An important part of the history of the YP is that the initial practices of clearing the land for broad acre farming and grazing did cause substantial environmental problems, particularly in the form of wind-blown dust. Much of this dust contains naturally occurring low levels of uranium throughout the YP, which most people would never realize, as these levels are too low to have a negative impact on the crops or the people who live on the YP.

Importantly Rex has undertaken a large amount of work in regards to understanding the levels of uranium in the Hillside deposit, the surrounding rock and in the surface soils covering the deposit. Rex has completed over 800 drillholes throughout the ore and waste rocks at Hillside. This has given Rex a high quality representation of the uranium levels in both the waste rock and the orebody. Rex has completed research to understand in detail the current background levels of uranium and other forms of radiation from the surface soils and crops at Hillside and the broader area (for full details see http://www.rexminerals.com.au/~rex/Lib/Docs/Appendix-39_Radiation-Baseline_Radiological_Assessment.pdf). Work completed by Rex identified where the uranium is within the copper ore body and Rex has used experts to assess the projected levels of uranium during and post mining.

At Hillside material that has uranium levels above 200 ppm occurs in less than 1% of all the material to be mined. Blending strategies in-pit will ensure that any material over 200 ppm uranium is mixed with other rock to dilute the uranium grade to below 200 ppm, as per EPA Guidelines. Currently the EPA is considering lowering their guidelines to 80 ppm. Rex’s blending strategies will meet the EPA’s Guidelines even if they are reduced.

During mining operations the level of uranium in the rock storage facilities (RSF) will not increase since open pit mining produces both waste rock and ore. The average uranium grade in the ore to be mined and processed at Hillside is 55.9 ppm. The average waste material from the processing plant (tailings) has a similar uranium grade as the total orebody of 57 ppm. The tailings material will be stored within a purpose built dam which will be encapsulated within waste rock with an average level of 10 ppm. The average concentration of uranium in the RSFs at closure will be 16 ppm which is inclusive of the tailings material that will be encapsulated. This is comparable to the concentration of uranium within some of the naturally occurring rock outcrops on YP (e.g. the costal granites) which are on average 14 ppm. To put these numbers into perspective, most of the world’s economically viable deposits of uranium ore are in the order of 1,000 ppm to 20,000 ppm, however some ore bodies in the Athabasca Basin, Northern Saskatchewan, Canada far exceed those grades.
The EPA provided information and answered questions with regards to the potential dangers of radiation contamination at Hillside at a recent community consultation meeting. The EPA concluded that the levels of uranium derived radionuclides in dust would be extremely low – well below levels that would impact on farming, public health or the environment in general. This extends to Hillside workers who would not be exposed to levels that would pose any concerns for their long term health. The sort of doses that the EPA expects miners at Hillside might receive is estimated at between a fifth and a tenth from what a miner might receive at Olympic Dam.

To put this in perspective, some imported phosphate fertilisers used on the YP contain significantly more uranium (10-100 times greater), than what is projected as dust fall-out from the Hillside mine itself. This is because phosphate fertilisers are made from phosphate rocks which contain varying levels of uranium. Where high annual rates of phosphorus fertilizer are used, this can result in uranium concentrations in soils and drainage waters that are several times greater than are normally present. However, the impact of these increases on the risk to human health from radionuclide contamination of foods is very small.

**The levels of uranium and associated radiation at Hillside will not impact on the safety of the public, workers or the environment. There is no evidence that uranium levels in the surrounding environment will increase as a consequence of the development of Hillside. Furthermore Rex will be held accountable to the EPA who will ensure that all uranium is managed appropriately.**

**Comparison of dose levels to Hillside**

A millisievert (mSv) is a measurement of a dose of radiation

<table>
<thead>
<tr>
<th>Dose Level</th>
<th>Description</th>
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<tbody>
<tr>
<td>0.067 mSv*</td>
<td>Generated by Rex’s operations at Hillside (Measured at closest residence)</td>
</tr>
<tr>
<td>0.35 mSv</td>
<td>Open pit miner at Hillside</td>
</tr>
<tr>
<td>0.4 mSv</td>
<td>Chest x-ray</td>
</tr>
<tr>
<td>2 mSv</td>
<td>Natural background environment in Australia from soils, food and water</td>
</tr>
<tr>
<td>4 mSv</td>
<td>Cabin crews and pilots for international flight routes</td>
</tr>
<tr>
<td>20 mSv*</td>
<td>Radiation worker dose limit</td>
</tr>
</tbody>
</table>

*Maximum dose received in a year

**Would you like to know more about uranium or radiation?**

If you have further questions about uranium or radiation, please visit, [www.radiationanswers.org](http://www.radiationanswers.org), which is a site dedicated to public education. The Australian Government’s website provides accessible information about radiation related issues at, [http://www.arpansa.gov.au/radiationprotection/index.cfm](http://www.arpansa.gov.au/radiationprotection/index.cfm). If you would like to read the full reports for Rex’s baseline radiological assessment and Rex’s radiation impact assessment, these were both published on Rex’s website in February 2014 and are available at;


Rex continues to be open and transparent in the information it provides and welcomes questions. Rex will continue to keep the broader community up to date with the most commonly asked questions in this section of our website [www.rexminerals.com.au/community-environment](http://www.rexminerals.com.au/community-environment) and through a series of and information sheets, such as this one.