**Request for Quotation**

**Ref: SC210001**

**Title: Toxicological advice on air pollutants [Review of published Environmental Assessment Levels for a number of Substances, based on updated toxicological information]**

## Section 4

## Information to be returned

**Please note, the following information requested must be provided. Incomplete tender submissions may be discounted.**

Please complete and return the following information:

- details of the personnel you are proposing to carry out the service, including CV's of your key personnel;
- detail your recent experience of carrying out similar contracts or projects
- details of proposed methodology
- completed Pricing Schedule (Appendix A);
- completed Prior Rights Schedule (Appendix B);
- confirmation that terms and conditions are accepted (Appendix C. Please note that the terms cannot be amended later).

**Details of the personnel you are proposing to carry out the service, including CV's of your key personnel**

The project will be delivered by TARA Consulting Ltd. Dr Sarah Bull (TARA) will be the project manager and the technical lead throughout the project.

As technical lead for toxicology, Sarah will provide technical advice and guidance where necessary to the team and provide a technical review of all work. If such issues cannot be resolved internally Sarah will inform the EA as soon as possible so a solution can be sought.

As project manager, Sarah will keep in regular contact with project team members, hence will be well informed of any technical issues should they arise. She will ensure deadlines are adhered to and will monitor financial spend on the project. She will also keep in regular contact with the Monitoring and Assessment team within the Chief Regulator's Group at the Environment Agency (EA) regarding the project, giving updates about progress, time, and budget against the planned project timeline.

Sarah Bull will be supported by Dr Joanna Wilding and Dr Ruth Bevan. Jo and Ruth will carry out the work and Sarah will provide a technical review to ensure high quality outputs.

An overview of relevant qualifications and experience are presented below. CVs are also presented separately.

**Dr Sarah Bull** (TARA) has a PhD in Toxicology, is a Eurotox Registered Toxicologist, and has over 20 years' experience in various toxicological areas, including in vitro, mammalian, human and regulatory toxicology, and human health risk assessment.

Sarah is well versed in working with Government Agencies having previously worked at the Department of Health Toxicology Unit and the Health Protection Agency (now UK Heath Security Agency (UKHSA)), where she provided toxicology and risk assessment advice to other Government agencies including the Environment Agency and Drinking Water Inspectorate, and the Expert Governmental Committees on Toxicity, Mutagenicity and Carcinogenicity (COT, COM and COC), as well as various other stakeholders on the potential effects of chemicals on human health.

Sarah is on the Royal Society of Chemistry Toxicology Committee, and the Environmental and Regulation Collective. She is also on the Scientific Committee on Health, Environmental and Emerging Risks (SCHEER) Working Group on Rapid Risk Assessment, is a member of the Office for Product Safety and Standards (OPSS) pool of scientific experts, on the Health and Safety Executive's REACH Independent Scientific Expert Pool (RISEP), an assessor for the European Registry of Toxicology and a member of the Drinking Water Inspectorates Drinking Water Quality advisory panel and the Herbal Medicines Advisory Committee (HMAC).

Her key areas of expertise lie in the toxicology and human health risk assessment of chemicals in environmental media such as water, soil and air; chemicals and consumer products. Sarah has previously derived Environmental Assessment Levels for a number of chemicals, including for chemicals used in carbon capture processes. She has also written a number of papers for the COT, COM and COC on various topics including e-cigarettes, aircraft cabin air and PFAS.

Sarah is an experienced project manager, having managed projects for EA, DWI, UKHSA plus numerous industrial clients.

**Dr Joanna Wilding** (TARA) has a PhD in ecotoxicology and a MSc in Pollution and Environmental Control, is a Chartered Environmentalist, Specialist in Land Condition (SiLC) and a Suitably Qualified & Experienced Person (SQP) under the National Quality Mark Scheme. Jo is also a SoBRA accredited risk assessor (ASoBRA) for human health.

Jo previously worked in the field of environmental public health at Health Protection Agency (now UKHSA), primarily focusing on chemical incident management (domestic and industrial), risk communication and supporting regulatory agencies in public health risk assessments for industrial activities. She moved to Cambridge Environmental Assessments to work in the toxicology department and now is an associated to TARA.

Her key areas of expertise are human health risk assessment, focusing on risks from contaminated land, hazard assessment and literature reviews. Jo has previously derived Environmental Assessment Levels for a number of chemicals, including for chemicals used in carbon capture processes. She has also recently been involved in preparing reports for the COT PFAS working group.

**Dr Ruth Bevan** has acted as an independent consultant since 2015 following her departure from Cranfield University where she held the position of Senior Lecturer in Human Health Risk Assessment, within the Institute of Environment and Health. Prior to joining Cranfield University, Ruth gained a BSc (Hons) in Applied Biology and PhD in Immunochemistry. Her post-doctoral studies on the detection of free radical damage to biomolecules were carried out at the University of Leicester.

Ruth is a Director/Owner of IEH Consulting Ltd., which was established in 2015. Her current expertise lies in toxicology and human health risk assessment in areas connected with environmental or occupational exposure to chemicals and she brings over 30 years' experience to IEH Consulting. Ruth's particular interests lie in the fields of biomarkers of both exposure and effect and in the setting of biological and occupational guidance values. She has published on a broad range of environment and health issues, notably in the field of occupational cancer burden and biomonitoring of environmental exposures (including via consumer articles, drinking water, food and air).

Ruth has extensive experience of project organisation and management for a wide range of clients. More recently she has become involved with the setting of guideline values for chemicals in drinking water and sits on the chemical expert working group for the WHO. In addition, Ruth is a fellow of the Society for Biology (FSB) and a long-standing member of the British Toxicology Society. She was also past Vice Chair and acting Chair of the Cranfield University Health Research Ethics Committee and was past editor for the Journal of Water and Health.

**Detail your recent experience of carrying out similar contracts or projects**

The team have extensive experience in deriving EALs for the EA.

Sarah, Jo and Ruth previously (in 2021) worked with the EA to successfully carry out a project entitled 'Toxicological advice on air pollutants', which necessitated developing a hazard screening methodology to identify chemicals for which the derivation of an EAL could be considered. The project entailed ranking chemicals according to hazard via inhalation, carrying out toxicological reviews and assessing the availability of pollution inventory data. Such a screening methodology was applied by the team in a further EA project entitled 'Hazard Ranking of Substances for Development of Environmental Assessment Levels for Substance Emissions to Air from Carbon Capture Technologies' in which EALs were derived for a number of chemicals.

As part of the project entitled ‘Toxicological advice on air pollutants’, two chemical dossiers and calculations of Tolerable Concentration in Air (TCA) were prepared for the EA, on which the short- or long-term EAL is based. In addition, the team provided advice on challenging issues identified in dossiers written by the UKHSA and finalised such dossiers.

Sarah and Jo were also joint collaborators with Ricardo for the EA project entitled ‘Development of Environmental Assessment Levels for Substances Emitted to Air from Post Combustion Carbon Capture Technologies’, delivered in 2023. The project initially identified 15 chemicals used in Carbon Capture for which EALs were required. The team delivered dossiers for eight chemicals. For seven of the identified substances, no or insufficient toxicological information was available, and the project included a report proposing methodologies to fill data gaps and to develop EALs for such substances used in carbon capture technologies.

Having developed the screening protocol, prepared chemical dossiers, and calculated TCAs and EALs, Sarah, Jo and Ruth have the expertise and knowledge to carry out this project efficiently and effectively.

Sarah, Jo and Ruth have also worked together on a number of other similar projects, including a literature review of male fertility effects of dioxins for the Food Standards Agency, and a number of reviews for the COT, including the safety of aircraft cabin air, the liver and thyroid effects of PFAS, the genotoxicity of titanium dioxide and a mixtures evaluation using M factors.

**Details of proposed methodology**

The aim of this project is to prepare chemical dossiers on the human and mammalian toxicity for substances identified by the EA, and to propose EALs for agreement with UKHSA.

The dossiers, and EALs, will be prepared in accordance with the methodology outlined in Guidance on the Derivation of Environmental Assessment Levels: https://www.gov.uk/government/consultations/derivation-of-new-environmental-assessment-levels-to-air (published October 2020).

*Data searching*

Inhalation, and oral (where necessary, if data suggest a more sensitive effect than via inhalation) toxicity data, and regulatory standards, will be searched for using authoritative websites for the substances identified in Table 1 of the Request for Quotation. Data will include mammalian and human toxicity data, *in vitro* and *in vivo* carcinogenicity and genotoxicity studies, pivotal studies for short- and long-term exposure and authoritative opinions proposed by other organisations. Data identified from authoritative bodies (based on the list or organisations in the updated methodology due for publication by the EA) will be assumed to be of good quality (Klimisch 1 or 2) and therefore acceptable to use.

If no data are available in reviews by authoritative bodies, searches to identify toxicological studies in primary and grey scientific literature will be carried out using ScienceDirect, Scopus and/or Abstract Sifter, using pre-defined keywords. If data from primary or grey literature are used, the quality of data will be assessed by deriving a Klimisch score using the ToxRTool. Only data of good quality (Klimisch 1 or 2) would be used.

*Data evaluation – threshold chemicals*

For chemicals that exhibit a threshold, the methodology described below will be followed.

All inhalation data will be assessed to identify the critical study following short- and long-term exposure. An appropriate point of departure will be determined from the critical study based on the most sensitive endpoint. In most cases, a no observed adverse effect level (NOAEL) will be selected as the point of departure. If a NOAEL is not available, the use of a lowest observed adverse effect level (LOAEL) will be considered. However, if a benchmark dose (BMD) is available, it will be considered as the point of departure or, if data allow, BMD modelling may be carried out using the European Food Safety Authority (EFSA) BMD software to determine a lower confidence interval of the BMD (BMDL) that produces a predefined response. Note, new BMD software was published by EFSA in 2023 so discussion regarding which model to use may be necessary.

If no robust inhalation data are available from which to determine a point of departure, the use of route-to-route extrapolation will be considered using oral or dermal data, following IGHRC guidance (http://www.iehconsulting.co.uk/IEH_Consulting/IEHCPubs/IGHRC/cr12.pdf ).

Once a point of departure has been determined, the NOAEL, LOAEL or BMDL is divided by an uncertainty factor to calculate the tolerable concentration in air (TCA). Uncertainty factors used are dependent on the study from which the point of departure is determined, so will be determined on a case-by-case basis. The (currently unpublished) EA guidance on the choice and value of commonly applied uncertainty factors will be taken into account as required. In general, uncertainty factors are used to account for animal to human extrapolation (interspecies differences), population sensitivities (intraspecies differences), type of study (short- or long-term exposures), use of a LOAEL, adequacy of the database and severity of endpoint. Additional uncertainty factors may be applied if route-to-route extrapolation is used to account for differences in absorption between oral and inhalation exposure. Full justification of the uncertainty factors applied will be included.

*Data evaluation – non-thresholded chemicals*

For chemicals that do not exhibit a threshold for the critical effect, e.g. genotoxic carcinogens, the methodology described below will be followed.

If human epidemiology data are available, inhalation Quantitative Risk Assessments will be assessed from which the dose equating to an excess lifetime cancer risk (ELCR) of 1 in 1,000,000 will be calculated using linear extrapolation and used as the TCA. Alternatively, a dose equating to a negligible increase in cancer could be established and used as the basis of the EAL.

If no human data are available, animal data will be assessed. If appropriate, a $BMDL_{10}$ will be determined or a T25 will be used as the point of departure. As with threshold chemicals, an uncertainty factor is applied to the point of departure. However, in contrast to threshold chemicals, the uncertainty factor used is predefined and dependent on the point of departure; i.e. 10,000 if a BMDL is used and 25,000 for a T25.

*Derivation of short- or long-term EALs*

Once the TCA has been calculated, the EAL is calculated using averaging times reflective of acute or chronic exposure periods. For threshold chemicals, a 24-hour averaging period is usually used to correlate with the oral health-based guidance value (the tolerable daily intake), but for non-threshold genotoxic carcinogens, an annual average is usually used.

This proposed methodology to determine the TCA and EAL can be amended subject to discussion with EA and UKHSA.

*Practical compliance*

Each dossier will include an assessment of practical compliance, taking into account the practical limit on the value of a short-term EAL if the long-term EAL or statutory value is not to be exceeded. The limit depends on whether the long-term EAL is based on either a threshold or a non-threshold health effect.

*Data reporting*

For each chemical, a dossier will be produced, in a format agreed with the EA and based on the two examples included in the Request for Quotation, and will include regulatory guidelines and recommended EALs, toxicokinetics, toxicity following short- and long-term exposure, pivotal studies, genotoxicity and carcinogenicity, mechanistic data. The critical studies from which the TCAs are derived will be described in some detail. Finally, recommendations for short- and long-term EALs will be provided along with practical compliance constraints will be included.

All approaches will be fully explained including the incorporation of modelling data as appropriate (such as the outcome of BMD modelling).

*Dossier finalisation*

The draft dossiers will be shared with the EA steering group (Task 2) for review. Feedback and any recommendations from the EA and UKHSA will be addressed (Task 3) before draft two of the dossier is provided to the EA (Task 4) and dossier finalised (Task 5).

*Meetings (via Microsoft Teams)*

A start-up meeting with the project team and EA steering group will be held to discuss the chemicals for which EALs will be derived, EAL methodology and project deliverables and timelines.

At the end of the project, the project team will present the EALs to the EA steering group, confirming final prioritisation and next steps for new dossiers (Task 6).

Provision of new dossiers, both a simple and complicated dossier, for an undefined number of substances (Task 7) will also be costed for in Annex A below.

**APPENDIX A - PRICING SCHEDULE**

ALL COSTS QUOTED MUST BE EXCLUSIVE OF VAT
All costs must be quoted on this schedule. Any costs not detailed will not be paid.

Please detail your task costs in the table below.

| **Cost Proposal (To be completed by Supplier)** | | | |
|---|---|---|---|
| **Tasks** | **Hourly Rate** | **No of Hours** | **Cost** |
| Task 1 Start up meeting | [redacted] | | |
| Task 2 Draft 1 of dossiers | | | |
| Task 3 EA Steering Group review | | | |
| Task 4 Draft 2 of dossiers | | | |
| Task 5 Final review of dossiers | | | |
| Task 6 Progress meeting | | | |
| Briefing note | | | |
| | | | |
| Total Staff Costs | | | £49,988 |
| **Expenses (please detail type, i.e. travel etc)** | | | NA |
| **Discounts applied (please detail) –** see below | | | £3,153 |
| | | **Total Overall Cost** | £49,988 |

**Other costs**
Please state any other costs that will need to be taken into consideration.

| **DESCRIPTION** | **COST £** |
|---|---|
| **1. Other costs (please detail)**<br>Purchase of studies (primary or grey literature) on which a proposed environmental assessment level is based, where practical to do so | [redacted] |

| | |
|---|---|
| **2. Other costs (please detail)**<br>Task 7. Provision of new dossiers for an undefined number of substances – complex dossier | [redacted] |
| **3. Other costs (please detail)**<br>Task 7 Provision of new dossiers for an undefined number of substances – easy dossier | [redacted] |
| **4. Other costs (please detail)** | |
| **TOTAL** | |

**Discounts, rebates and reductions**
Please detail below any discounts, rebates and other reductions you are prepared to offer and the basis of those incentives

| **DESCRIPTION** | **AMOUNT**<br>£ |
|---|---|
| Reduced day rate for reviewing dossiers | [redacted] |
| No charge for a project director | [redacted] |
| Reduced price for the start-up meeting | [redacted] |
| **TOTAL** | [redacted] |

**Total Overall Cost**

Please detail the total fixed cost for the project

| **ITEM** | **TOTAL AMOUNT**<br>£ |
|---|---|
| **Staff Costs** | £49,988 |
| **Other Costs** | [redacted] |
| **Discounts/reductions** | £3,153 |

| | |
|---|---|
| **TOTAL Overall Cost** | £49,988 + cost of papers |

The following limits will be applicable to all claims for travel and subsistence under this contract:

a. Travel by rail: standard class should be used at all times
b. Travel by car: 45 pence/mile

Hotel bookings should be made through the Environment Agency's corporate travel contract. Details of this contract are available from the Corporate Contracting Team.

When making reservations you should state that you are a contractor working on Environment Agency business.

Hotel charges must not exceed a maximum limit per night bed and breakfast (VAT included) of: £160 in London; £100 in all other destinations. Please note that these hotel ceiling rates are subject to change throughout the life of the contract.

Expenditure on dinner during an overnight stay must not exceed a maximum limit of £33, including a drink.

Receipts for all rail travel, hotel and food expenses will be required as proof of expenditure and will be reimbursed at cost. No profit or additional cost shall be applied by the contractor to such personal expenses.

**APPENDIX B - PRIOR RIGHTS SCHEDULE**

Details of Prior Rights held by the Parties (To be updated as Rights are introduced during the period of the Contract)
Prior Rights owned or lawfully used by a Party, whether under licence or otherwise, which it introduces to the Project for the purposes of fulfilling its obligations under the Contract.

Held by the Environment Agency

| **Name and description of Prior Rights** | **Extent of proposed use in the Project** | **Proprietary owner of the Prior Rights** |
|---|---|---|
| | | |
| | | |
| | | |

Held by the Contractor

| **Name and description of Prior Rights** | **Extent of proposed use in the Project** | **Proprietary owner of the Prior Rights** |
|---|---|---|
| NA | NA | NA |
| | | |
| | | |

**Explanation of Contractor's Prior Rights**
All Intellectual Property Rights owned by or lawfully used by the Contractor, whether under licence or otherwise before the date of this Contract. It can also mean any invention and know how or other intellectual property (whether or not patentable) owned by one of the parties prior to the commencement of the Project, or devised or discovered by one of them only in the course of other projects during the Project period and not arising directly from the Project.

**APPENDIX C – ACCEPTANCE OF TERMS AND CONDITIONS**

I/We accept in full the terms and conditions named in Section 2 and appended to this Request for Quote document.

Company Name __Toxicology and Risk Assessment Consulting (TARA) Ltd_____

Signature _____  _____

Print Name ____Sarah Bull_____

Position __Director_____ _____

Date ___26th November 2024 _____