Annual report on Activities Performed by the UK NRL for GMOs in Feed and Food

FSA Contract Reference Number: FS616029
Provision of UK National Reference Laboratory Services for Genetically Modified Organisms in feed and food

Period covered: 1st April 2018 – 31st March 2019

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Glossary

CRM - Certified Reference Material

DNA - Deoxyribonucleic acid

EFSA - European Food Safety Authority

ENGL - European Network of GMO Laboratories

EURL - EU Reference Laboratory for GMOs in feed and food

FSA - Food Standards Agency

FVO - European Commission Food and Veterinary Office

GeMMA - genetically modified materials analysis

GMO - Genetically Modified Organism

IRMM - Institute for Reference Materials and Measurements

JRC – Joint Research Centre (Italy, Ispra)

NRL - National Reference Laboratory (nominated under Regulation (EC) 882/2004)

nrl - national reference laboratory (under Regulation (EC) 1829/2003)

OCL - Official Control Laboratory

PA - Public Analyst

PAFF - Standing Committee on Plants, Animals, Food and Feed

PASS - Public Analyst Scientific Services

PCR - Polymerase Chain Reaction

PSP - Pre-Spotted Plate

SASA - Science and Advice for Scottish Agriculture

SC – Steering Committee

WG – Working Group

Role of the National Reference Laboratory

Commission Regulation (EC) 882/2004 (later replaced by Commission Regulation (EC) 2017/625, some of which came into force on 29th April 2018) was introduced to remove variation in the way European Community legislation is implemented in different Member States. This regulation relates to official controls designed to ensure the verification of compliance with feed and food law, animal health and animal welfare rules. The aim is to create an integrated and more comprehensive, risk-based, 'farm to fork' approach to official controls. The objective is to improve the consistency and effectiveness of controls across the EU and, as a consequence, raise standards of food safety and consumer protection.

The Regulation sets out the general approach that must be taken and the principles that must be adopted by the authorities in EU Member States with responsibility for monitoring and enforcing feed and food law. These include the competent authorities organising and undertaking official controls. The various central Government agencies and local authorities that are responsible for organising and undertaking official controls constitute the competent authorities and include (for food and feed) the Food Standards Agency, the Health and Safety Executive and the Department of Environment, Food and Rural Affairs (Defra).

Regulation (EC) 2017/625 also specifies requirements for certain specialised laboratories to provide the science that underpins regulation:

- Official Control Laboratories (OCLs): Central competent authorities designate official laboratories for the purposes of chemical analysis or microbiological examination of feed or food samples taken by enforcement practitioners (in the UK they are Public Analysts (PAs) and Agricultural Analysts (AAs)).
- National Reference Laboratories (NRLs): In order to provide technical and scientific support for the official control framework, the European Commission has created a network of National Reference Laboratories (NRLs) co-coordinated by European Union Reference Laboratories (EURLs).
    - EURLs are appointed by the European Commission. They provide the Commission with scientific and technical assistance. They are responsible for providing NRLs with details of analytical or diagnostic methods, including reference methods, and co-coordinating their application (in particular by organising comparative testing). They conduct training courses for NRL staff and keep them up to date in their field of expertise. They also coordinate practical arrangements needed to apply new analytical/diagnostic methods.
    - NRLs: Each Member State must designate an NRL to correspond to each EURL. NRLs must collaborate with the EURLs in their particular area of expertise and disseminate nationally information provided by the EURLs. They are responsible for co-coordinating the activities of OCLs and should, where appropriate, organise comparative tests between them. In addition, they provide scientific and technical assistance to the central competent authorities.

The responsibilities and tasks of NRLs are specified in Article 101 of Regulation (EC) 2017/625. National reference laboratories shall, in their area of competence:

a) Collaborate with the European Union reference laboratories, and participate in training courses and in inter-laboratory comparative tests organised by these laboratories;
b) Coordinate the activities of official laboratories designated in accordance with Article 37(1) with a view of harmonising and improving the methods of laboratory analysis, test or diagnosis and their use;
c) Where appropriate, organise inter-laboratory comparative testing or proficiency tests between official laboratories, ensure an appropriate follow-up of such tests and inform the competent authorities of the results of such tests and follow-up;
d) Ensure the dissemination to the competent authorities and official laboratories of information that the European Union reference laboratory supplies;
e) Provide within the scope of their mission scientific and technical assistance to the competent authorities for the implementation of MANCPs referred to in Article 109 and of coordinated control programmes adopted in accordance with Article 112;
f) Where relevant, validate the reagents and lots of reagents, establish and maintain up-to-date lists of available reference substances and reagents and of manufacturers and suppliers of such substances and reagents;
g) Where necessary, conduct training courses for the staff of official laboratories designated under Article 37(1); and
h) Assist actively the Member State having designated them in the diagnosis of outbreaks of foodborne, zoonotic or animal diseases or of pests of plants and in case of non-compliance of consignments, by carrying out confirmatory diagnoses, characterisation and epizootic or taxonomic studies on pathogen isolates or pest specimens.

For the 2018-2019 period, the EURL did not publish an annual work programme.

NRL duties include advising the competent authority (FSA, Defra, Chemicals Regulation Directorate and Veterinary Medicines Directorate), and OCLs on sound measurement science and appropriate sampling methods.

LGC has maintained the position for the UK National Reference Laboratory for Genetically Modified Organisms (GMOs) in feed and food since the inception of the position in 2009, following open competitive tenders in 2009, 2013 and 2017. LGC's appointment by the Food Standards Agency on behalf of the European Commission is under Regulation (EC) 882/2004 (later replaced by Commission Regulation (EC) 2017/625, some of which came into force on 29th April 2018), which aims to remove variation in the monitoring and enforcement of feed and food law across the European Union. As the National Reference Laboratory for GMOs, LGC conducts the following activities, as specified in the contract with the FSA:

Core Function
Objective 01 – Secretariat Service (Core Function A)
Objective 02 – Advice and Representation within the UK/EU (Core Function B)
Objective 03 – Production of Standard Operating Procedures, Codes of Practice and Guidance Documents (Core Function C)
Objective 04 – Compliance Assessment via audits and ring trials (Core Function D)
Objective 05 – Co-ordination within the UK of EURL initiatives (Core Function E)
Objective 06 – Communication of results and data use (Core Function F)

Additional Tasks
Objective 07 – Additional services and Tasks (as detailed in Annex I of the invitation to tender)

Core Function

Production of the NRL annual report

This report details the activities carried out during the 10th year of the NRL operation (April 2018-March 2019) in relation to the duties of the NRL.

OBJECTIVE 01 - SECRETARIAT SERVICES - (CORE FUNCTION A)

Tasks:

- **Disseminating information/advice supplied by the EURL and its working groups to the FSA, OCLs and other relevant laboratories in a timely and effective manner.**
- **Creating and maintaining an efficient two-way channel of communication with OCLs and relevant laboratories and the EURL, including disseminating information on analytical methods and EU Regulations to OCLs and feedback of comments from OCLs to the EURL.**
- **Providing regular updates to the FSA on NRL activities, and up-to-date information on UK OCLs and other relevant laboratories to the FSA as requested.**
- **Creation and maintenance of a dedicated website for communication of the work of the NRL including provision of advice and support to OCLs, information on methods of analyses, SOPs, latest developments and other background information.**

Example activities in relation to these Tasks:

- Compiled and submitted the NRL Annual Report 17/18.
- Published the NRL newsletter: Winter 2017 / Spring 2018. Circulated to all OCLs and to the FSA.
- Distributed an E-mail from the EURL/DG-SANTE to OCLs, requesting they contribute towards a survey on any analytical issues currently experienced with use of Certified Reference Materials for GMO analysis provided by AOCS.
- Responded to an E-mail from the EURL/DG-SANTE to OCLs, requesting the NRL contribute towards a survey on any analytical issues currently experienced with using Certified Reference Materials from AOCS for GMO analysis. Response to the survey was considered mandatory for NRL's appointed under Official Controls Regulation (EU) 2017/625 (which replaced the previous 882/2004 regulation) as the issue is considered an official control issue.
- Wrote and distributed the LGC summary report to the 35th ENGL Steering Committee meeting held in June 2018 at the JRC (Ispra) to the FSA and all UK ENGL labs.
- Circulated to the FSA the official ENGL report associated with the 35th ENGL Steering Committee meeting held on 12th /13th June 2018 at the JRC (Italy), provided by the ENGL Secretariat. The FSA were previously supplied with the LGC report to this ENGL Steering Committee meeting in the June period of 2018.
- Provided the FSA with the webpage address of the LGC NRL webpage, so that they could provide a direct link through to this via the revised FSA website.
- Provided the FSA and UK ENGL members (inclusive of OCLs) with the summary report to the 14th NRL workshop and 29th ENGL plenary meeting, held at the JRC (Ispra) in October 2018.

- Distributed to the FSA and OCLs the revised and published full version of the report on the testing of the event-specific method for detection and identification of GM wheat MON71200.

OBJECTIVE 02 - ADVICE AND REPRESENTATION WITHIN THE UK/EU - (CORE FUNCTION B)

Tasks:

- **Providing impartial expert advice as requested to the FSA, OCLs and other relevant laboratories on analytical methodology in the context of Official Controls.**
- **Representing the UK at relevant EURL meetings, and its working-groups, consulting the FSA on objectives and requirements before each meeting and providing the FSA with an internal report of the meeting within two weeks of each meeting.**
- **Participating in activities organised by the EURL and contributing to the scientific input at EURL meetings and in manner which supports UK policy based on best available scientific knowledge.**
- **Advising the FSA, OCLs and other relevant laboratories on best scientific practice in testing for Official Controls and undertaking activities in consultation with the FSA that facilitate and promote their application in the UK within the policy aims of the FSA.**
- **Keeping abreast of and advising the FSA, OCLs and other relevant laboratories of developments for the sampling, testing and detection of analytes.**
- **Identifying and informing the FSA, OCLs and other relevant laboratories of emerging analytical issues or developments at a national, European or international level and recommending action to address them.**

During the April 2018 to March 2019 period, the NRL received and responded to 39 individual enquiries as part of the NRL function. This included 23 enquiries from the FSA as the Competent Authority, 5 enquiries from UK OCLs and 11 enquiries from EURL/UK stakeholders (including other UK ENGL labs and Defra). Compared to previous operational years of the NRL function, the duration and complexity of a number of enquires was significantly increased, mainly due to the intricacy of the enquiries related to preparing for EU exit on the 29th March 2019 and the likely impact upon UK science.

Example activities in relation to these Tasks:

Received and responded to 23 individual enquiries from the FSA.
Example advice provided:

- Provided advice to the FSA on actionable evidence on how the UK (FSA and NRL) had responded to the FVO audit of 2014 in relation to the two recommendations of screening and quantitation of GMOs according to Regulations (EC) 1829/2003 and 1830/2003, and the implementation of EU Regulation 619/2011 on the low level presence (LLP) of unauthorised GMOs in feed.
- The FSA requested additional assistance regarding evidence of how the UK had responded to the FVO 2014 audit recommendations on sampling and guidance and implementation of 619/2011. The NRL collated and provided the following information:

    Interactions regarding six requests to the EURL for the need for published harmonised guidance on the implementation of 619/2011;

Metrics associated with 38 queries the NRL received from OCLs in line with general GMO analytical capability in support of Regulations 1829/2003 and 1830/2003;

Provided traceability on an E-mail chain from the FSA and circulated by the NRL to OCLs in July 2016 asking for OCL comment on a new draft of the FSA sampling guidance in food and feed for GMOs;

- Interactions with individual UK OCL's to help assess current UK analytical capability for GMO control;
- The NRL supplied the FSA with a list of those OCLs with GMO analytical capability, to allow the FSA to make an informed decision on a report to the EC/FVO following the FVO audit in 2014. Also provided the full official names of the OCL labs according to the Association of Public Analysts website;
- The NRL provided comment and advice on a draft response the FSA were preparing to send back to the EC to provide evidence of addressing the recommendations following the FVO audit of 2014;
- The NRL advised the FSA with respect to an update on actions and progress associated with the UK response to the FVO audit of 2014. FSA had been asked to attend an evidence session with European Commission SANTE F auditors at Defra in connection with a General Follow-Up UK Audit.

- Circulated an E-mail sent by the EURL to the FSA and UK OCLs. This was with respect advice on testing for recombinant (GM) DNA from the GMM *Bacillus subtillus* in market samples containing the feed additive Vitamin B2.
- Answered query from FSA with respect to an EURL E-mail request on samples which showed false positive results of the cry1a/1b SYBR Green test for Chinese GM rice on wild type rice when no Chinese GM rice were present. Based on laboratory expertise housed at the NRL, the NRL related experiences on the repeatability of the assay in general, but had not experienced issues of false positive results concerned with cry1a/1b.
- Provided a four page summary on NRL views on likely impact of EU exit (no longer having access to EURL services) on UK capability in the GMO area and provided this to the FSA. Issues revolved around not having information currently provided by the EURL in terms of methods, databases, reference materials and technologies (e.g. pre-spotted plate screening system). It was likely that the UK would have to independently fund these areas in order to emulate the level of service currently provided by the EURLs.
- Forwarded on to the FSA the impact assessment made by SASA on the likely effects of EU exit on GMO testing capability at SASA. These reinforced the NRL views previously discussed with the FSA.
- The FSA asked the NRL to raise a query with the EURL at the 29th ENGL meeting in October 2018 regarding interpretation of Article 101(f) in EU Regulation 2017/625. This corresponds to the NRL maintaining a list of reference materials and reagents (where relevant) and validating those reagents. The NRLs' view on this was that the NRL currently maintains an active archive of EURL control plasmids, but CRMs are commercially available otherwise. EURL/ENGL published guidance is available on the need and how to validate reagents for PCR with the emphasis on "where

relevant", as it would be impractical for the NRL to maintain lists of all of the possible PCR reagents available for GMOs from all market providers (but this may be more feasible in other NRL areas where tests are limited and more prescriptive).

- Provided the FSA with further information on the original European Court of Justice ruling in 2018 regarding gene editing.
- Responded to a query from the FSA regarding OCL capability to conduct GMO analysis following EU exit.
- Reviewed a document for the FSA summarising the current UK analytical capability for GMO analysis and provided a view point on this capability post EU exit in March 2019. The NRL raised concerns regarding maintenance of UK analytical capability being dependent upon agreed access to new methods, reference materials, databases and technologies post EU exit.
- Following a group UK NRL workshop in December 2018, the NRL provided the FSA with further information on the concerns and resilience of the UK control network for access to PT schemes, reference/control materials, and attendance at EURL network meetings within the NRL specialist scientific field. The NRL was concerned that there was no real substitute for the face-to-face EURL/ENGL meetings as this gave exactly the right level of engagement. The GMO NRL suggested that it may be possible for recognised experts to be invited to attend the ENGL/EURL meetings, but this would be subject to the withdrawal terms agreed during EU exit and attendance would have to be funded.
- Provided a response to the FSA for a request regarding an outline of the full EU GMO authorisation procedure and what role the EURL takes. Included timeframes, costs, the procedure itself, information required for assessment, and number of applications per year. The FSA asked for views on solutions for how easily the UK could deliver the EURL services in relation to getting a GMO approved for commercial use in the UK.

Received and responded to 5 individual enquiries from Official Control Laboratories. Example advice provided:

- Responded to queries from an OCL regarding sampling for GMOs. Query was whether to grind and homogenise aggregate grain sample before taking sub-samples, or to homogenise aggregate grain sample, take sub-samples and then grind. The OCL was also concerned how to provide three equal samples from the bulk shipment so as to avoid any trace level contamination. Both NRL and GC functions were consulted. A response was provided taking into account published guidance on detection of GM rice originating from China as well as the UK formal sampling. The response suggested taking multiple items to a maximum number divisible by three (e.g. nine) when there was a risk of compromising the sample, and allocate these into three portions to the FBO, OCL and GC. For processed samples, multiple retail packs to achieve either (not less than) 3 times 2.5kg (total 7.5kg) or (not less than) 3 times 500g (total of 1500g). Raw grain samples were more restrictive and (no less than) three times 2.5kg (total 7.5kg) must be taken. For rice grains in 25kg sacks or in bulk, three samples should be taken at the point of sampling.
- Forwarded an E-mail on behalf of FSA to OCLs regarding the current FSA Guidance for Sampling food and feed for genetically modified (GM) material.

- Circulated an E-mail to all OCLs and the FSA in relation to a preliminary report from the EURL-GMFF on a method for the detection of Canadian GM wheat 71200.

Received and responded to 11 individual enquiries from additional sources (e.g. other UK ENGL labs, Defra, etc.)

Example advice provided:

- Replied to an E-mail from the EURL requesting feedback on the use of the test for Chinese GM rice. There had been reported occurrences of the Cry1Ab/Ac assay providing false positives in the presence of wild-type rice, and the EURL were asking for additional evidence of this. The UK NRL replied saying that the cry1Ab/Ac assay sometimes had issues of repeatability associated with it in their hands, but the NRL had never reported on a false positive based on the cry1Ab/Ac assay. However, the NRL felt that such a false positive could occur in a specific set of circumstances. The poor repeatability of the cry1Ab/Ac assay coupled with the poor repeatability of the T-NOS and P35S assays that the NRL had previously encountered meant that the NRL was supportive of the efficacy of the published method being reviewed.
- Replied to two enquiries from SASA (Science and Advice for Scottish Agriculture) to help provide access to summaries and presentations from the EURL GMO screening workshop held in May 2018 and also to the anticipated format of the ENGL plenary meeting in October 2018.
- Provided advice on measurement uncertainty estimation for GMO analysis, as part of discussions held with SASA and through the GC function. Topics of interest included how to make and express uncertainty estimates, how to combine uncertainty from different sources, and what value to provide to coverage factors to provide confidence in an expanded uncertainty estimate. These discussions and the GC advice provided will help support analytical testing laboratories and promote a greater understanding of how to capture, report and express measurement uncertainty estimates.
- Contacted the FSA and asked them for views on a draft Explanatory Note on the topic of detecting products originating from new gene editing approaches. This followed on from the European Court of Justice ruling in 2018 that the products of synthetic biology should come under the pre-existing legislation for labelling and detection of GMOs. The Explanatory Note was further discussed at the 29th ENGL meeting in October 2018.
- Reviewed and contributed to the resulting JRC technical report on gene editing approaches which the JRC is preparing at the request of DG-SANTE. The report underlines some of the challenges the EU will encounter when trying to authorise, detect and quantify products of gene editing (GE).

OBJECTIVE 03 - PRODUCTION OF STANDARD OPERATING PROCEDURES, CODES OF PRACTICE AND GUIDANCE DOCUMENTS - (CORE FUNCTION C)

Task:

- **Contributing to the development of standardised operating procedures, relevant codes of practice and guidance documents for use by OCLs and other relevant laboratories, as requested by the FSA.**

Activities in relation to these Tasks:

- The UK NRL is a full member of the following ENGL Working Groups:
    - "Overview and recommendations for the application of digital PCR" (WG-dPCR)
    - "DNA Extraction" (WG-DNAex)
    - "ENGL Procedures" (WG-ENGLProc)
    - "Good practice/quality of DNA sequencing data" (WG-seq)
- The aim of the digital PCR Working Group (WG-dPCR) is to provide an ENGL Guidance Document detailing advice on best measurement practice for the application of dPCR for GMO analysis in analytical laboratories. The final draft of the guidance document resulting from this Working Group should be published early 2019.
- The aim of the newly formed DNA extraction Working Group (WG-DNAex) is to: (1) Create a webspace and forum for capturing and sharing information and data related to DNA extraction; (2) Provide a comprehensive Guidance document on the selection of DNA extraction methods, their characteristics and scope for specific food and feed matrices in the frame of official controls; (3) Support the organisation of a second training workshop on DNA extraction.
- The aim of the ENGL Procedures Working Group (WG-ENGLProc) is to provide guidance on selected administrative procedures associated with the day-to-day operation of the ENGL. The ENGL Consortium Agreement provides rules and procedures for all main aspects of the ENGL, including membership, work program and confidentiality. However, it does not cover procedures for the routine activity of the network, e.g. approval workflow of documents, management of observers, participation to meetings of non-ENGL members etc. A draft of the relevant guidance document is being finalised and should be forwarded on to the ENGL Steering Committee for approval prior to Summer 2018.
- The aim of the Good practice/quality of DNA sequencing data (WG-seq) is to provide a guidance document in relation to a literature review of the state of the art of DNA sequencing, detection and identification of GMOs, modelling scenarios when DNA sequence information is known, targeted DNA sequencing approaches, detection strategies for authorised and un-authorised GMOs, instrument descriptions; quality control criteria for assessing sequencing reads, metagenomics; validation of NGS pipeline with associated criteria, and future perspectives.
- Contributed as a full author to the third edition of the technical guidance on JRC "Guidance document on Measurement Uncertainty for GMO Testing Laboratories" which was first published in 2009. The existing document was in need of updating with respect to new experiences, new legislation and the introduction of dPCR. The resulting document should be published in the summer of 2019.

- Reviewed and contributed to the JRC Technical Report on “Detection of food and feed plant products obtained by new mutagenesis techniques”. This report was requested by the EC (DG-SANTE) as an explanatory note on some of the challenges with detecting plant products as a result of gene editing. The report is due to be sent to DG-SANTE in March 2019.
- Delivered an invited presentation on screening approaches at the EURL workshop on GMO screening approaches held in Gembloux (Belgium) in June 2018.

OBJECTIVE 04: COMPLIANCE ASSESSMENT VIA AUDITS AND RING TRIALS - (CORE FUNCTION D)

Tasks:

- **Ensuring consistency and quality of testing approaches applied by UK OCLs and other relevant laboratories, including advising on corrective action following adverse reports on OCLs from UKAS**
- **Co-ordinating training exercises to promote best laboratory practice in respect of analysis**
- **Participating in proficiency tests and method validation studies organised by the EURL, informing the FSA of the results and implementing any corrective measures required**

Example activities in relation to these Tasks:

- Participated in and submitted results for the 17th EURL Comparative Test (ILC_EURL_GMFF_CT_01_18). Received Z-scores of 0.2, -1.3 and 0.6 for the three GM events of Maize MON89034, Maize MON810 and Soya DAS68416 respectively, which were all successfully detected and quantified in the samples.
- Participated in and submitted results for the 18th EURL Comparative Test (ILC_EURL_GMFF_CT_02_18). Received Z-scores of 1.4, 0.1, and -1 for the three GM events of Soya 40-3-2, Soya MON87701 and Maize Bt11 respectively, which were all successfully detected and quantified in the samples.
- Following a new procedure adopted by the JRC for all EURL's, PT round invitations are only sent through to NRL's under 2017/625 and 120/2004. EU member state's OCL network are still free to participate. Forwarded this invitation on to UK ENGL members who regularly participate in such PT rounds.

OBJECTIVE 05 - CO-ORDINATION WITHIN THE UK OF EURL INITIATIVES - (CORE FUNCTION E)

Task:

- **Archiving of Standard materials (Control Materials) provided by the EURL**

Example activities in relation to these Tasks:

- The NRL continues to maintain a dedicated physical and electronic register for control materials held in a secure cold room.
- Received, registered and archived the following new ENGL control plasmids:
    - Bacillus Subtilis Event 558 (GMM)
    - Cotton COT102
    - E.coli Strain AG3139 (GMM)
    - E.coli K-12 Strain 19E (GMM)
    - Maize MZHG0JG
    - Maize MZIR09
    - Oilseed rape MS11
    - Wheat MON71200
- A full list of the registered ENGL plasmid control materials is provided in Annex 2.

OBJECTIVE 06 - COMMUNICATION OF RESULTS AND DATA USE - (CORE FUNCTION F)

Tasks:

- **The Contractor shall ensure that the FSA receives regular updates of any developments related to the core functions of the NRL.**
- **The Contractor shall notify the FSA immediately by email of any deviations which may affect the cost, specifications and timing of the annual work programme.**
- **The Contractor shall notify the FSA immediately by email of any unusual occurrences resulting from any of the core functions of the NRL.**
- **The Contractor shall provide interim reports during the annual work programme.**
- **Provide an internal report of meetings with other organisations (such as Official Control Laboratories, the EU-RL and ENGL) within 10 working days.**
- **Any results or reports arising from the work of the NRL will not be communicated to any external parties without the written permission of the FSA.**
- **The use of the data for presentations and / or papers will not be permitted unless written permission has been sought and given by the FSA.**
- **The Contractor will maintain records for a period of 3 years from the end of the contract.**
- **In other work related to the core functions of the NRL the specified deadlines agreed between the FSA and the Contractor should be met.**
- **If necessary, at the end of the Contract all information and data gained from, and required for, NRL function over the course of the Contract will be handed over to the FSA. This will include assisting with transfer of archived reference materials.**
- **The Contractor will keep the NRL website up to date on developments, relevant information (especially to the OCLs) and the work of the NRL.**

Example activities in relation to these Tasks:

- The UK NRL is in constant contact with the FSA by E-mail and phone in relation to queries, updates, developments and deliverables.
- The UK NRL is available for provision of advice on GMO analysis to all OCLs by E-mail, phone and face-to-face meetings where appropriate.
- Summaries on all ENGL plenary meetings that the UK NRL attends are supplied to all OCLs and the NRL is fully contactable in order to provide further details on each meeting as is necessary.
- Full meeting reports for the ENGL plenary and NRL annual meetings and summaries of the ENGL SC meetings are provided to the FSA.
- The NRL routinely organises, hosts and chairs the regular National Reference Laboratory Liaison Meeting with the FSA.

ADDITIONAL TASKS

OBJECTIVE 07:- ADDITIONAL SERVICES AND TASKS (as detailed in Annex I of the invitation to tender)

Tasks:

- **If required, assist the EURL in testing and validating the methods of detection for GMOs, when necessary.**
- **Participate and contribute to the scientific input at meetings, e.g. the European Network of GMO Laboratories (ENGL) meetings, and working groups in a manner which supports UK policy on GMOs based on best available scientific knowledge.**

Example activities in relation to these Tasks:

- The NRL was invited to participate and present at the ENGL GMO Screening workshop, held at CRA-W (Gembloux, Belgium) in collaboration with RIKILIT in June 2018. This three day interactive workshop was attended by 40 participants from 19 different EU member states and was aimed at discussing and agreeing best analytical practice in the area of screening strategies for the detection of EU authorised and unauthorised GMOs. Outputs from the workshop included agreeing a harmonised approach for detecting and reporting the results from GMO screening methods as a cost effective aid towards identification and quantitation of possible GM events present in a sample.
- Malcolm Burns represented the UK at the 35th European Network of GMO Laboratories (ENGL) Steering Committee meeting, held at the JRC-Ispra in June 2018. Topics of interest included anticipated publication of EC guidance on DNA extraction, multiplex PCR, digital PCR and DNA sequencing, as well as discussions on detection of genetically modified micro-organisms, and the success of a recent EC workshop on GMO screening. Further topics included discussions on international networking activities as well as availability and quality associated with some certified reference materials.
- The NRL hosted the annual FSA-NRL liaison meeting for the GMO and Feed Additive positions at LGC in July 2018
- The NRL attended the joint 14th NRL workshop and 29th ENGL plenary meeting at the JRC (Ispra) in October 2018.
- The NRL participated in the joint FSA/Defra "Food and Feed NRLs workshop" at Nobel House in November 2018. All Food and Feed NRLs were invited to share experiences and concerns regarding UK scientific capability and capacity following EU exit.
- Malcolm Burns represented the UK at the 36th European Network of GMO Laboratories (ENGL) Steering Committee meeting, held at the JRC-Ispra in February 2019.

Annex 1: Additional links to NRL annual reports and Newsletters

Copies of previous GMO NRL annual reports and Newsletters are freely available to download from the UK GMO-NRL webpages at: https://www.lgcgroup.com/what-we-do/national-laboratory-and-government-roles/national-laboratory-roles/national-reference-laboratories/ .

Annex 2: List of ENGL Control materials housed by the NRL

GM	Species	ENGL plasmid no.
Event 558 (GMM)	Bacillus Subtilis	pENGL-00-EM-01/18-01
281-24-236	Cotton	pENGL-00-14/05-01
3006-210-23	Cotton	pENGL-00-14/05-01-B
COT102	Cotton	pENGL-00-05/16-01
GHB119	Cotton	pENGL-00-04/11-01
GHB614	Cotton	pENGL-00-14/07-01
LL25	Cotton	pENGL-00-13/04-01
MON1445	Cotton	pENGL-00-15/04-01
MON15985	Cotton	pENGL-00-24/04-01
MON531	Cotton	pENGL-00-16/04-01
MON88701	Cotton	pENGL-00-01/13-01
MON88913	Cotton	pENGL-00-05/07-01
T304-40	Cotton	pENGL-00-05/11-01
GM Strain AG3139	E.coli	pENGL-00-04/08-01
GM Strain 19E	E.coli K-12	pENGL-00-06/08-01
3272	Maize	pENGL-00-03/06-01
5307	Maize	pENGL-00-07/11-01
59122	Maize	pENGL-00-03/05-01
Bt11	Maize	pENGL-00-12/05-01
Bt11	Maize	pENGL-00-10/07-01
BT176	Maize	pENGL-00-18/04-01
DAS-40278	Maize	pENGL-00-10/10-01
DP-4114	Maize	pENGL-00-02/14-01
GA21	Maize	pENGL-00-15/05-01
GA21	Maize	pENGL-00-29/04-01
LY038	Maize	pENGL-00-01/06-01
MIR162	Maize	pENGL-00-08/08-01
MIR604	Maize	pENGL-00-04/05-01
MON810	Maize	pENGL-00-25/04-01
MON863	Maize	pENGL-00-01/04-01
MON87403	Maize	pENGL-00-02/15-01
MON87411	Maize	pENGL-00-01/15-01
MON87427	Maize	pENGL-00-03/12-01 MON87427
MON88017	Maize	pENGL-00-16/05-01
MON89034	Maize	pENGL-00-06/06-01
MZHG0JG	Maize	pENGL-00-04/16-01
MZIR098	Maize	pENGL-00-04/17-01
NK603	Maize	pENGL-00-27/04-01

GM	Species	ENGL plasmid no.
T25	Maize	pENGL-00-08/04-01
T25	Maize	pENGL-00-08/04-01
TC1507	Maize	pENGL-00-02/04-01
VCO	Maize	pENGL-00-07/12-01
DP73496	Oilseed rape	pENGL-00-02/12-01
MON88302	Oilseed rape	pENGL-00-09/11-01
Ms1	Oilseed rape	pENGL-00-11/04-01
Ms11	Oilseed rape	pENGL-00-03/16-01
Ms8	Oilseed rape	pENGL-00-06/04-01
Oxy-235 genomic DNA	Oilseed rape	Oxy-235 oilseed rape
Rf1	Oilseed rape	pENGL-00-09/04-01
Rf2	Oilseed rape	pENGL-00-10/04-01
Rf3	Oilseed rape	pENGL-00-07/04-01
RT73	Oilseed rape	pENGL-00-26/04-01
T45	Oilseed rape	pENGL-00-14/04-01
Topas 19/2	Oilseed rape	pENGL-00-12/04-01
EH92-527-1	Potato	pENGL-00-09/05-01
Bt63	Rice	pENGL-00-EM02/06/01
40-3-2	Soybean	pENGL-00-08/05-01
A2704-12	Soybean	pENGL-00-13/05-01
A5547-127	Soybean	pENGL-00-01/08-01
CV127	Soybean	pENGL-00-01/09-01
DAS44406-6	Soybean	pENGL-00-01/12-01 DAS44406-6
DAS-68416-4	Soybean	pENGL-00-11/10-01
DAS81419-2	Soybean	pENGL-00-03/13-01 DAS81419-2
DP-305423-1	Soybean	pENGL-00-07/07-01
DP-356043-5	Soybean	pENGL-00-04/07-01
FG72	Soybean	pENGL-00-04/10-01
MON87460	Soybean	pENGL-00-04/09-01
MON87701	Soybean	pENGL-00-05/09-01
MON87705	Soybean	pENGL-00-01/10-01
MON87708	Soybean	pENGL-00-02/11-01
MON87751	Soybean	pENGL-00-03/14-01
MON87769	Soybean	pENGL-00-07/09-01
MON89788	Soybean	pENGL-00-05/06-01
SYHT0H2	Soybean	pENGL-00-04/12-01
H7-1	Sugar beet	pENGL-00-28/04-01
MON71200	Wheat	pENGL-00-EM-02/18-01