United Kingdom Onshore Pipeline Operators' Association

UKOPA Infringement Working Group

2007 Report for the UKOPA Infringement Database

Owing to the confidential nature of the information contained in this report, it is intended for distribution to, and use by, UKOPA members only

1. Introduction

Until 2002, UKOPA members investigated 'near miss' and damage incidents ('infringements') on their buried pipeline assets on an individual basis. Although points of learning from the most significant incidents were shared amongst UKOPA members via established communication processes, the membership recognised that

- any information, analysis and learning from near miss incidents was limited to individual company efforts and their data-set
- the Association was not exploiting its collective experience to key national data and trends
- as a consequence industry response lacked co-ordination and national coherence

The UKOPA infringement database provides a framework for recording infringements without requiring companies to adopt technically identical definitions. With a range of pipeline systems and operators, this latter point has been the key to enable the collection of data on a national pipeline industry basis.

Since its launch in 2001 the database has allowed members to share infringement details and trends, allowing the Association to develop effective improvement plans and ensure its experience can be fully exploited to influence and support regulatory processes.

The structure and content of the infringement database is described in the 'Guidance for Members preparing records for the UKOPA Database' which is available via the Members Centre of the UKOPA Website. A more general introduction to the database is available via *www.ukopa.co.uk/excavation-safety/Introduction-to-the-UKOPA-Infringement-Database.pdf*

2. Current Status and Management of Database

At the end of 2007, the following companies provided records for the UKOPA infringement database

- National Grid
- BP
- Ineos
- Esso Petroleum
- E.On
- Unipen (MJL)
- Wales & West Utilities
- Shell
- SABIC UK Petrochemicals
- Total (UK)
- BPA
- OPA
- Scotia Gas Networks
- Northern Gas Networks

A number of these members provided their data via single route by means of their participation in Linewatch

From 2002 – 2004 contributions to the database were derived from chemical and oil sector pipelines. With the addition of records from the UK natural gas distribution system from 2005, database content has increased significantly, as shown in Figure 1.

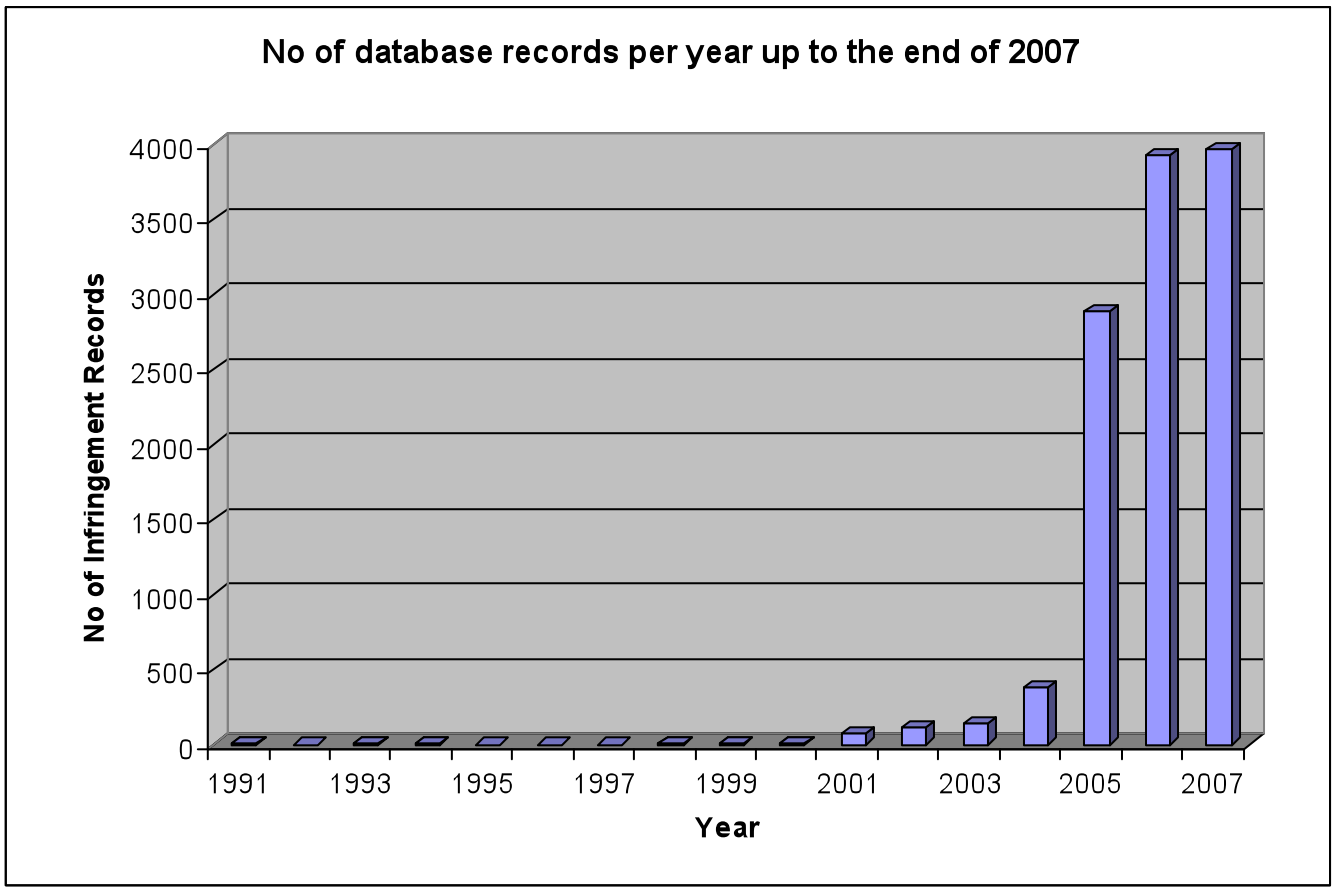

Figure 1 – Growth of total database records

Although it has proved difficult to formally confirm the total number of hazardous pipeline operators in the UK, UKOPA membership (and hence database representation) is thought to exceed 95% of all operators. As a result, it provides an authoritative view on the third party threat to hazardous pipelines in the UK.

Activities relating to the operation of the database and development of excavation safety strategy are managed by UKOPA's Infringement Working Group (IWG), whose membership during 2007 was constituted as follows :-

Mark A Harrison	SABIC UK Petrochemicals (IWG Chair)
Mike Thomson	Ineos Manufacturing Scotland
Ken W Smith	BP FPS
Tony Gillard	Shell UK
Linton Haw	SABIC
Guy M Hemsley	BPA
Jim Stancliffe	HSE
Neil W Jackson	National Grid Gas
Chris Clarke	Wales & West Utilities

The database is managed in a MS Excel format, members contributions are provided in a matching format to allow efficient import of new records.

3. Key events during the year

In addition to the ongoing development of the database and utilisation of resulting data, the IWG have initiated a number of other related activities, including :

- development of an 'industry standard' excavation safety DVD for eventual use by all UKOPA members

4. Main findings

4.1. Infringements by Category

The UKOPA database categorises infringements on the basis of risk and location indices as follows:-

Risk index can be one of three levels

Risk Index	Infringement Type	Infringement Description
A	Pipeline Damage or Leak	Includes damage to wrap or protective sleeve
B	Serious Potential for Damage	Methods or equipment used could have resulted in significant damage had excavation taken place at pipeline
C	Limited Potential for Damage	Methods or equipment would not have resulted in serious damage

Location index can be in two forms

Location Index	Location Description
1	Within the pipeline wayleave or easement. Typically, this is the zone within which the pipeline operator has legal rights, including a requirement by the landowner to notify planned work (although may be different for non-Pipelines Act lines laid by Statutory Undertakers).
2	Within the pipeline operators zone of interest, but outside the pipeline wayleave or easement. It is the area within which the operator would have reasonably expected a competent third party to have given notification in the prevailing circumstances.

So that infringement categories can be summarised as follows

	Actual Damage	Serious Potential for Damage	Limited Potential for Damage
Within Wayleave or	A1	B1	C1

Easement			
Within Operators Notification Zone	-	B2	C2

The resulting analysis of infringements by category shown in Figure 2 shows the distribution of infringements is generally consistent with a proportional relationship between learning events, near-misses and more serious incidents (the so-called 'Heinrich's triangle').

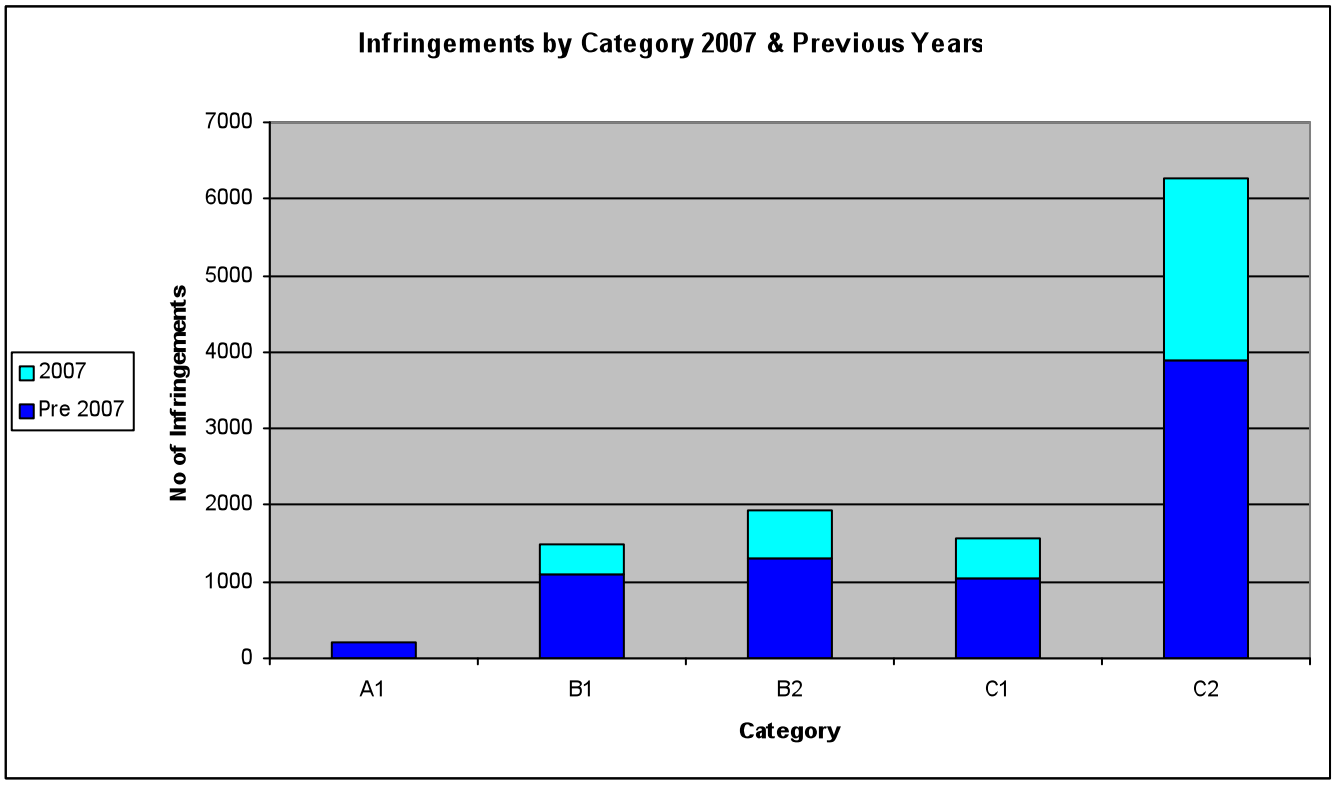

Figure 2 Infringements by Category

4.2. Infringements by Activity Type

Understanding the types of activity contributing to infringement statistics provides important information for:

- targeting awareness training and communication
- relating to infringement location and vulnerable areas

Figure 3 shows the distribution of infringements across reported activity types. Although 'activity unknown' is the largest single contributor, at this point in the life of the database it is not yet possible to establish whether this is indicative of infringements for which an activity could not be assigned, or whether it simply represents issues with data collection and entry into the database.

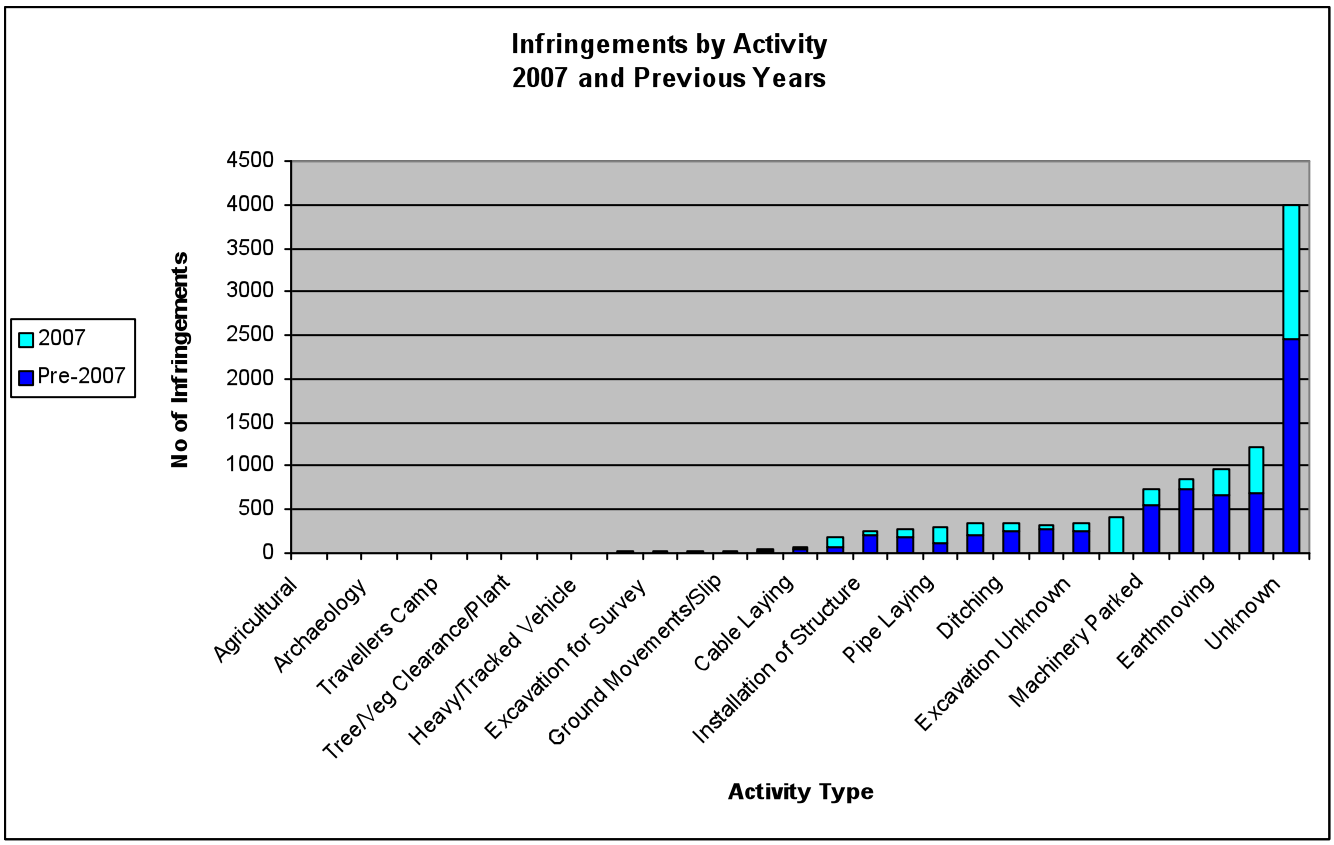

Figure 3 Infringements by Activity Type

Looking at the dataset in more detail, it is possible to review all A1 (pipeline damage or leak) incidents vs activity type, as shown in Figure 4. The trends for this dataset are generally representative of the overall 'by activity type' information.

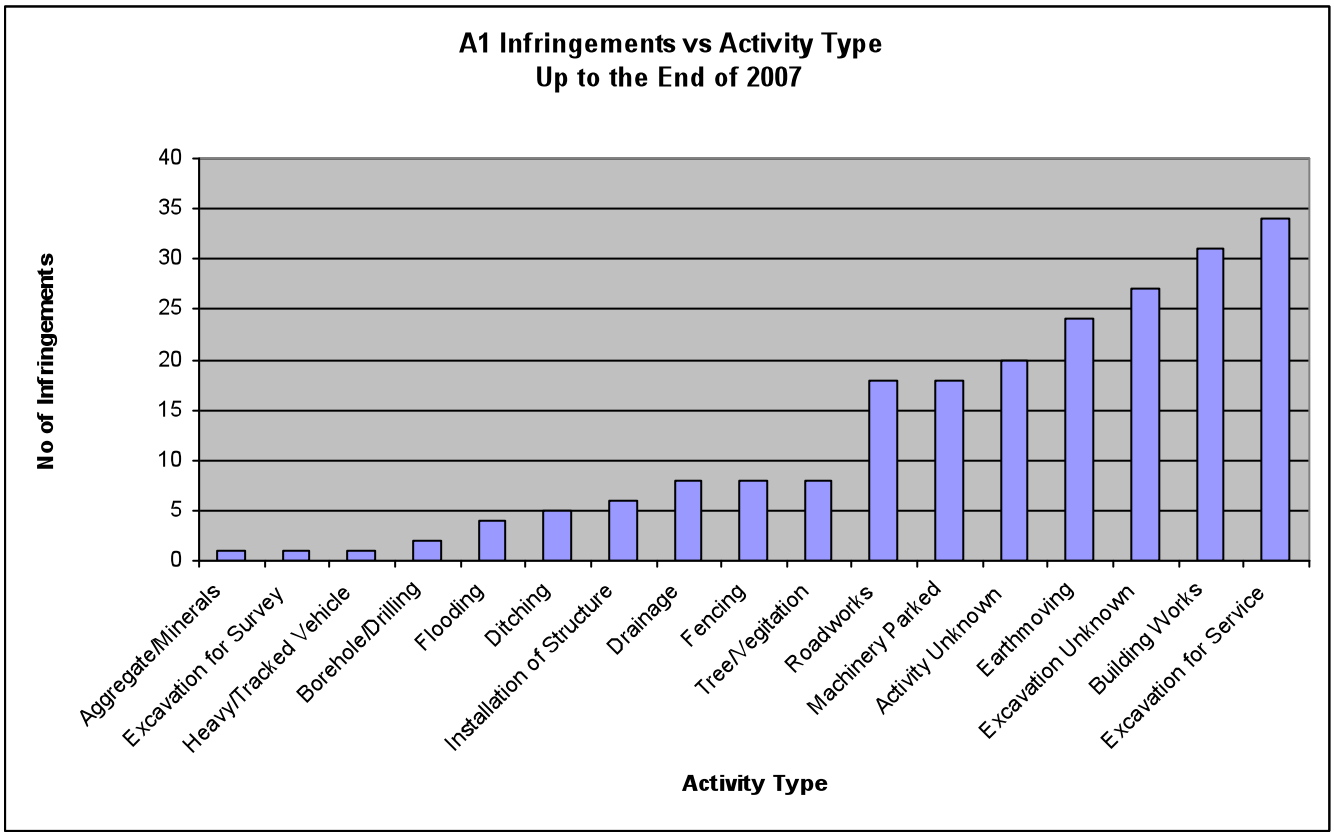

Figure 4 A1 Infringements by Activity Type

4.3. Infringements by Location

Locations where infringements may take place provide key information for:

- the main areas of pipeline vulnerability
- areas where marking is critical
- areas where excavator vigilance is particularly important

As shown in Figure 5, farmland continues to be the setting for the largest single amount of infringements. Road crossings and road verges together account for nearly 1200 infringements.

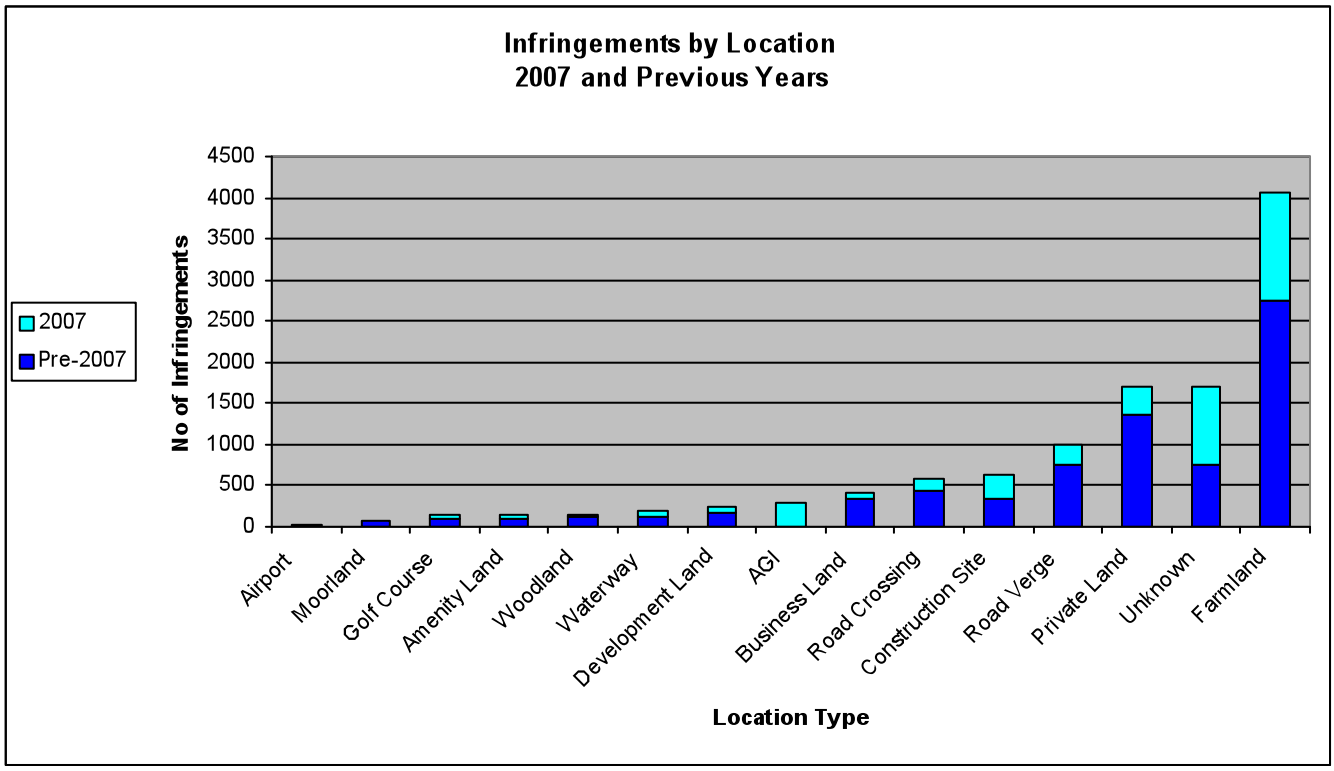

Figure 5 Infringements by Location

4.4. Infringements by Third Party Type

UKOPA are interested in which types of third parties are infringing

- Are there any patterns?
- What does it tell us about the weakness of the sub-contracting 'chain'?
- Who is responsible for checks and searches in each case?
- What does it tell us about the 'pipeline awareness' of those actually doing the digging?

Figure 6 describes the current position. The presence of landowners as the largest single infringing group is not inconsistent with the position of farmland as the setting for the largest single amount of infringements shown in Figure 5. It should be noted, however, that the distinction between 'contractor' and 'utility' can be seen as a very fine one when one considers the increasing levels of contractor-delivered utility services in the UK.

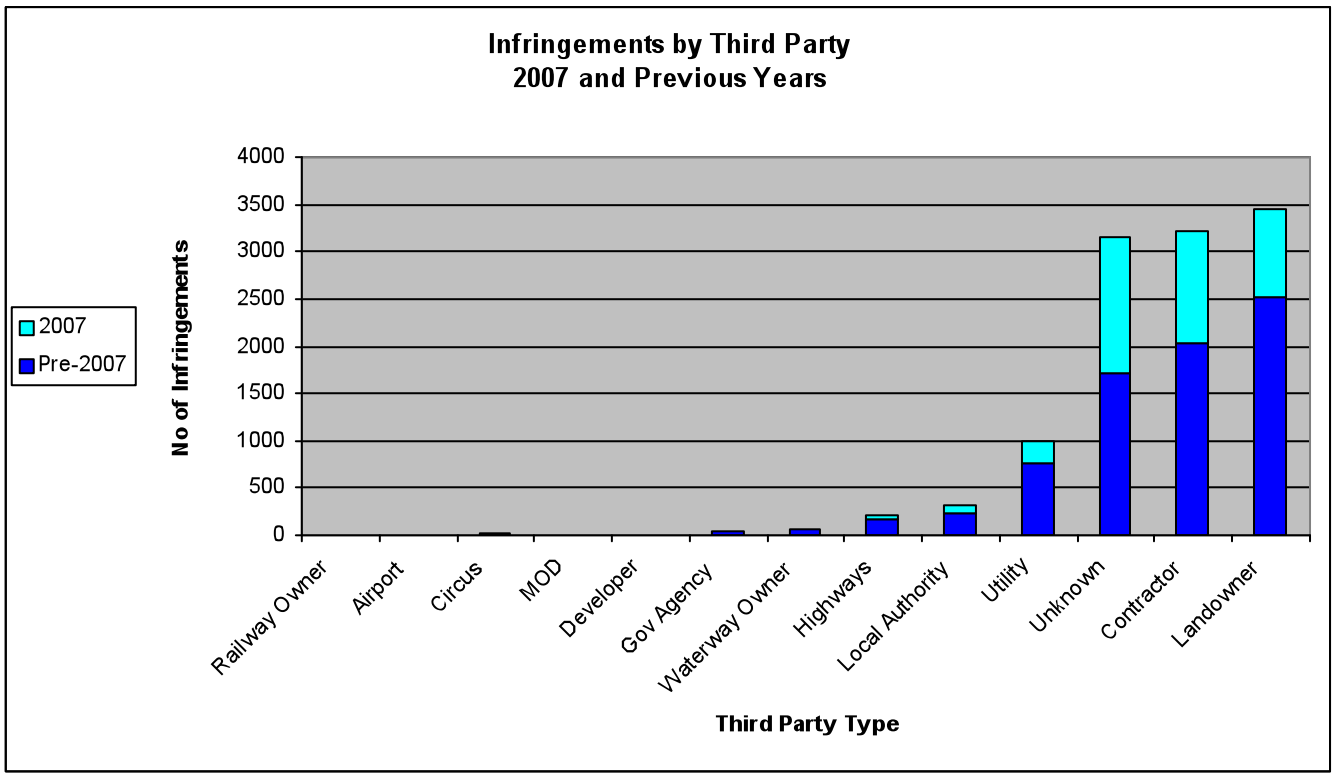

Figure 6 Infringements by Third Party Type

Again, looking at the dataset in more detail, it is possible to review all A1 (pipeline damage or leak) incidents vs third party type, as shown in Figure 7. As with the A1 infringements versus activity type data shown in Figure 4, the trends for this dataset are generally representative of the overall (all categories) information.

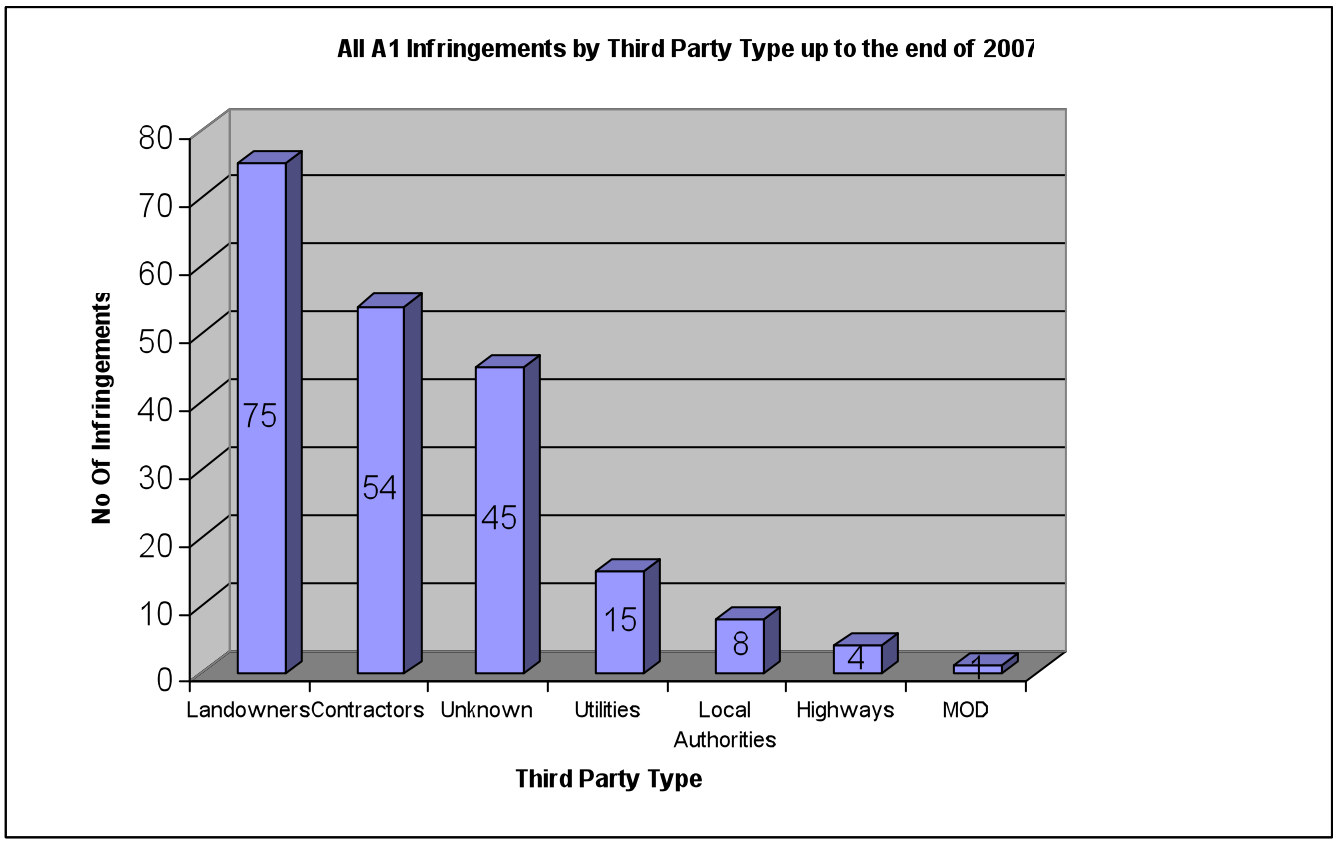

Figure 7 A1 Infringements by Third Party Type

4.5. Infringements by Third Party Name

UKOPA are interested in identifying and working with anyone who has, or has the potential to infringe. Those third parties who via the database are identified as having made multiple infringements are a particular concern.

As invited members of UKOPA, the Health & Safety Executive have access to the list of 'repeat infringers'. The database output in the form shown in Figure 8 has been used by HSE to inform their annual inspection programme. There is no doubt that to date, this is the area where the database has had its greatest impact. For companies that operate on a region-by-region basis, there is some evidence to suggest that through UKOPA's database activities, they have become aware of their overall infringement behaviour for the first time. HSE's feedback is that this data has received serious attention at senior levels within each company.

UKOPA remains very aware that the infringement performance of particular companies or agencies is a very sensitive issue. Data is provided by individual operators for use in the database on the understanding that individual records are, in the first instance, confidential. Therefore data in the form shown in Figure 8 is confidential to UKOPA members and should not be shared with third parties.

A further point to note regarding this data is that it currently makes no attempt to analyse numbers of infringements per third party with their national excavation activity rate. Such a measure, if it were to be developed in future, would provide a much more meaningful expression of each third party's effectiveness in managing activities adjacent to hazardous pipelines.

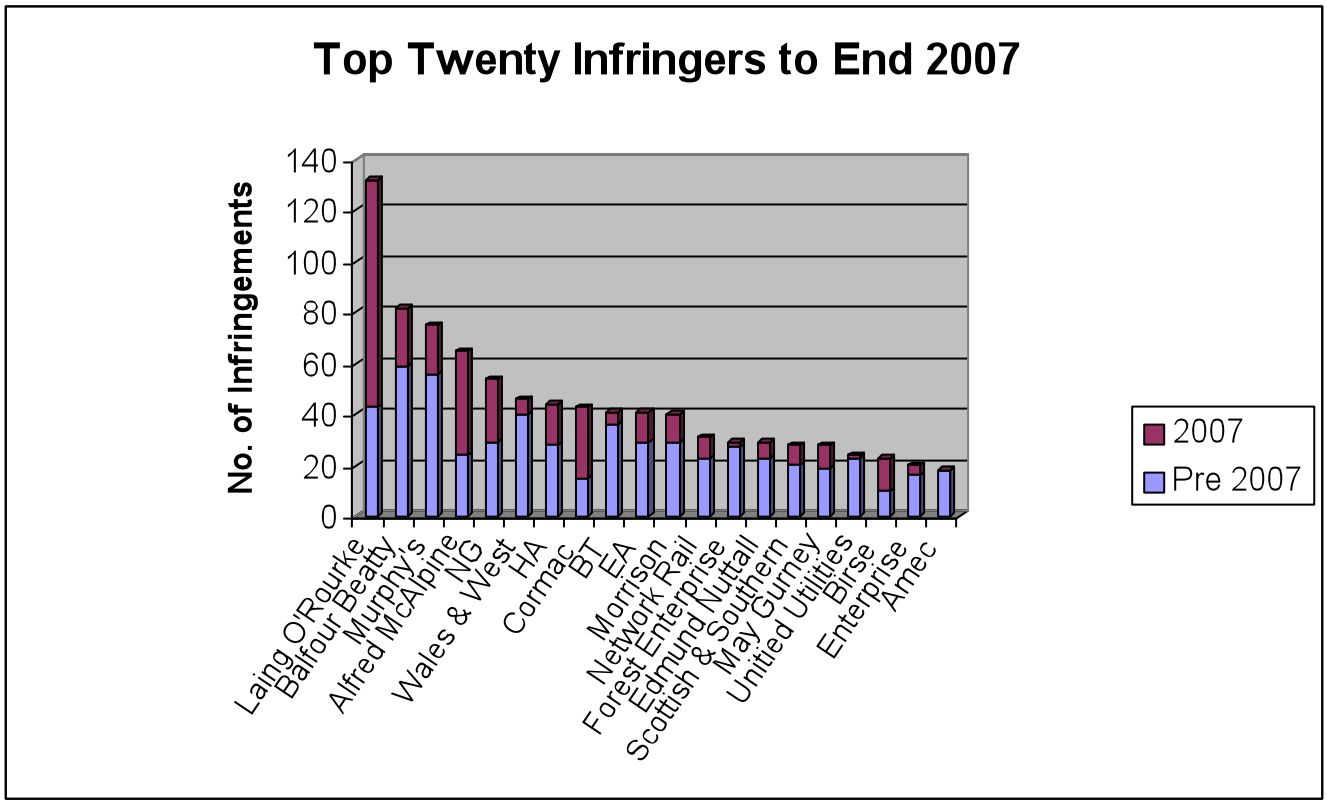

Figure 8 Infringer Identity versus No of Infringements

5. Plans and future

5.1. Data Quality

In order to consolidate the current success of the database, and develop it further, the IWG and Fisher German will continue to encourage contributing members to improve the quality of their records. Whilst the overall statistical significance of the database has improved and will continue to improve greatly with the participation of the natural gas operators, true statistical significance of the component fields relies heavily on comprehensive completion of all fields for each data record.

5.2. Database Content

The IWG and Fisher German will continue to consult with UKOPA members to ensure that the data fields within the database appropriately represent the findings from operator's investigations of infringements.

The challenge for the IWG will remain, however, to ensure that as new fields are developed, this is completed with due regard for the evolutionary nature of development of data collection by the large volume (i.e. natural gas) contributors. These operators use large scale integrated databases which exist for purposes much wider than support of the infringement database, and so addition of new fields will be subjected to critical value and timing assessments.

5.3. Data Collection

From 2008 management of this database will be contracted to Fisher German, who will continue to collect and collate infringement data from UKOPA members. This report will be formulated by Fisher German and issued following approval by UKOPA on a yearly basis.

It is anticipated that all contributing pipeline operators will forward infringement data on a quarterly basis using the web based infringement database to Fisher German. This change of management for the infringement database report will improve the quality and efficiency of data management and will ensure that the report is issued in a timely manner.

All data needs to be critically reviewed, however, to ensure obvious errors are not added and to ensure that where appropriate data field entries are consistent with agreed standards.

5.4. Data Analysis

As the infringement database continues to increase, so its statistical significance as a source of data for UK excavation safety will follow. The size of the dataset will enable the use of statistical analysis techniques to reveal trends and outputs.

6. Acknowledgements

The development and current success of the infringement database would not have been possible without the support of UKOPA members. Their trust in providing the infringement records and the resources necessary to make the input to UKOPA should not be underestimated.

It is also important to recognise the important role played by the HSE's Gas & Pipelines Unit. They have shown faith in UKOPA's excavation safety activities, providing a valuable member of the IWG, who in turn has worked very effectively with his UKOPA colleagues in pursuit of improved awareness of excavation safety in the vicinity of hazardous pipelines.

Special thanks to Linton Haw for his work in collection, collation and interpretation of the 2007 third party pipeline infringement data.