

Effectiveness of Cost Recovery Charging

**Technical Report
E92**

Effectiveness of Cost Recovery Charging

R&D Technical Report E92

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The report will be of use to the Agency's Economic instruments group, as background to the effectiveness of existing charges and the scope for development. It can be used by Finance Directorate to aid in further development of Agency charges. It should also be used by those involved in understanding how businesses behave in response to the environment, by showing how one part of the Agency's activity (charging) affects them.

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EXECUTIVE SUMMARY

KEY LESSONS FROM THE STUDY

This research has examined, through survey work, the way in which different enterprises are affected by the Environment Agency's system of cost recovery charging for abstraction licences and discharge consents. The aim has been to understand what enterprises know about these charges, how they treat them on an ongoing basis, and how the charges affect, if at all, their behaviour.

The principle findings are as follows:

ABSTRACTION LICENCES

118 companies from selected industrial sectors were interviewed. These interviews were supplemented by interviews with 4 water service companies and 3 water supply companies in the four regions selected for examination.

- ❑ Only 33% of the sample (of 118 enterprises) review the costs of their abstraction licences. 64% do not. Whether or not companies review costs appears to be related to the size of company. In general, larger companies are more likely to review costs.
- ❑ Of the sample treat licence costs as just one part of general company expenditure. A much smaller number actually treat licences as part of more specific expenditure items (see Fig. 1).

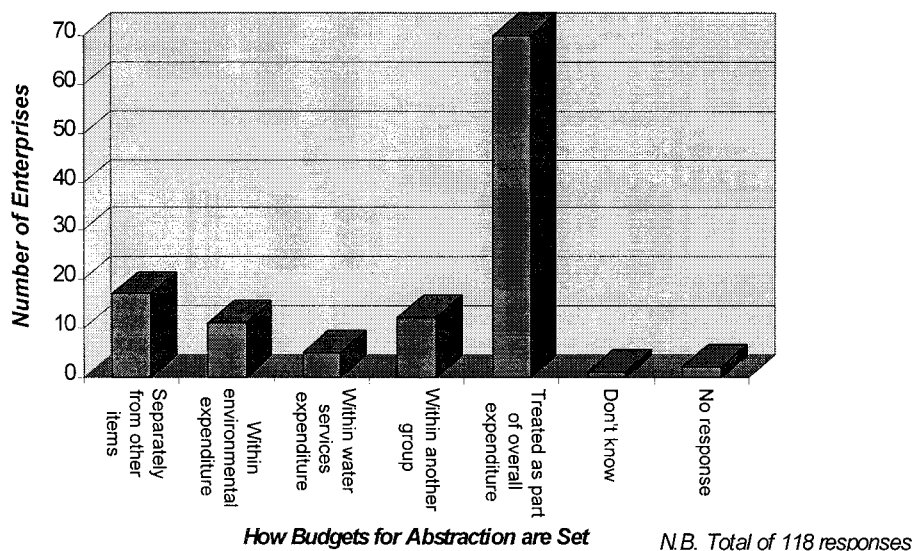
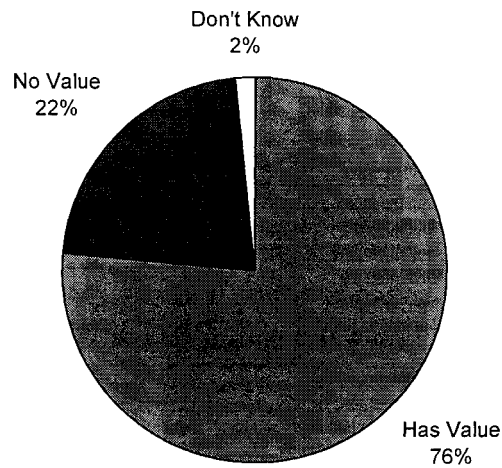


Figure 1 : Ways In Which Budgets For Abstraction Are Set

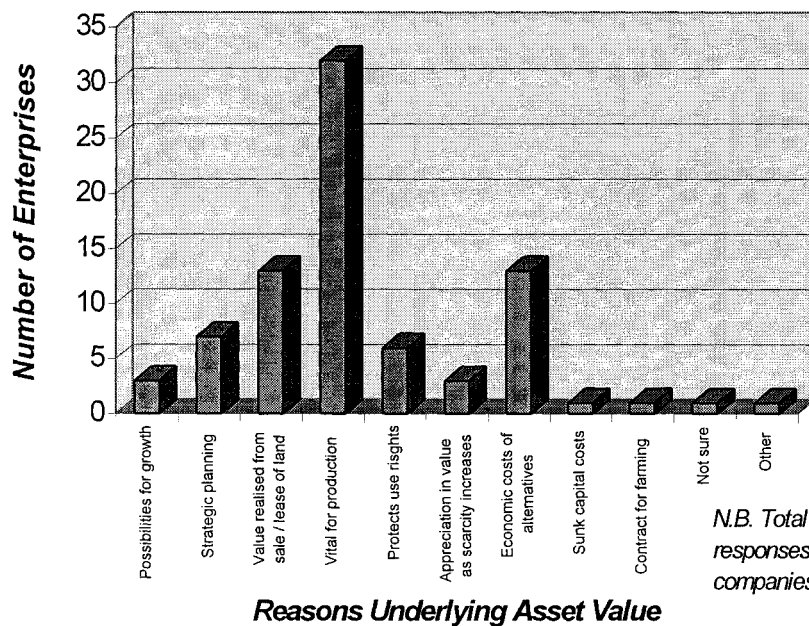
- Of those interviewed 96% said that they saw their licence as an asset. 22% said that they did not (Figure 2).



N.B. Total of 118 respondents

Figure 2 : Companies Perceptions Regarding The Asset Value Of Licences

- The reasons given to explain the asset value are shown in Figure 3. They include the essential nature of licences to the business, the cost of alternatives, and the value that licences give to land owned by the holder.



N.B. Total of 81 responses from 75 companies

Figure 3 : Reasons For Underlying Asset Value Of Licences

- Just over a third of respondents feel the charge is set at about the right level. 43% feel the charge is low or fairly low, whilst 19% feel the charge is high or fairly high. A number of enterprises were more or less aware of the cost recovery aim of the scheme, and we believe that these responses should be set in the context of that understanding.

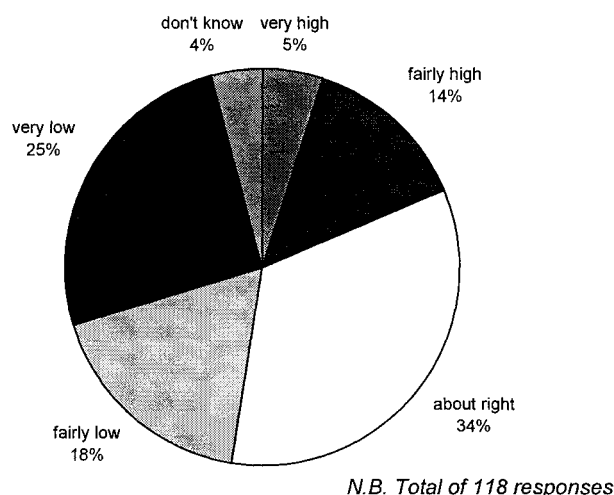


Figure 4 : Responses Concerning The Level Of Licence Charges

- By all other standards, the charge would appear to be low. Typically, it is of the order 0.05% of turnover. However, the figure is higher for small companies and for the farming sectors (the two will be related in our survey). It is lowest for the food and drink sector.
- The charge for abstraction is typically much less than that for energy, though the evidence is less clear for the costs relative to waste disposal.
- 48% of the sample had made reductions in their use of water in the past (see Table 1).

Table 1 : Level Of Reduction In Water Use Achieved By Respondents

Level of Reduction in Water Use	Number of Companies
0% (no reduction in use)	61 (52%)
up to 20%	22 (19%)
21% - 40%	14 (12%)
41% - 60%	16 (14%)
> 60%	8 (7%)
Reduction made, but % not known	7 (6%)
TOTAL	118

- Of 56 companies responding, only 5 who had undertaken such reductions saw the charge as very influential in that decision whilst 5 more saw it as fairly influential. 46 said that it was

not influential at all. Only 3 companies had altered their licence after reducing water use confirming the strength of the asset value of the licence (though some of the reduction activities had been forced upon companies reaching their licenced limit).

- ❑ All companies were asked about the strength of the incentive provided by the charging scheme. Only 9 enterprises (8% of the sample) felt that the incentive was highly significant. Interestingly, more than half of these were from the food and drink sector, the sector for whom the charge as a percentage of turnover is lowest. Most commented that there was no incentive to undertake reductions in use.

Table 2 : Strength Of Incentive Provided By Charging Scheme

Strength of Incentive	Number of Enterprises
No incentive	78
Insignificant	14
Significant but insufficient to promote reduction in abstraction	16
Highly significant	9
TOTAL	117

- ❑ Generally, regarding whether costs are reviewed and whether water use reduction measures have been undertaken, Anglia and Yorkshire regions perform better than Northumbria and Wales. There is no obvious reason for this and it does not appear related to the charging scheme itself (the Standard Unit Charges for Anglia are one of the highest, and in Yorkshire they are the lowest, in the country).
- ❑ The way budgets are set does appear to have some influence upon these two performance variables. Performance is better where budgets are set as part of a separate group of expenditure items. Where abstraction costs are treated as part of overall expenditure, performance is not so good.

These views are generally confirmed by interviews with water companies. they too suggest that the incentive effect from charging is all but non-existent. The strongest impact of the charging scheme *per se* was felt by two companies whose budgets were set in advance of the annual changes to the SUC, and for whom the charge necessarily implied trimming back on expenditure elsewhere within their allotted budgets.

DISCHARGE CONSENTS

93 companies from selected industrial sectors were interviewed. These interviews were supplemented by interviews with 4 water service companies from the four regions selected for examination.

- ❑ Only 12% of those questioned were sure of the band that their discharge was classified in. 44% of those surveyed were unable to provide any details of what they paid. This poor knowledge extended to the reason for levying the charge. Around half of those questioned (48%) were aware of the true purpose of the charges.
- ❑ Over 30% of companies felt that the charge level was about right, though 35% thought it was either very, or fairly, high. A smaller number (23%) thought that the charge was very, or fairly low (Figure 5).

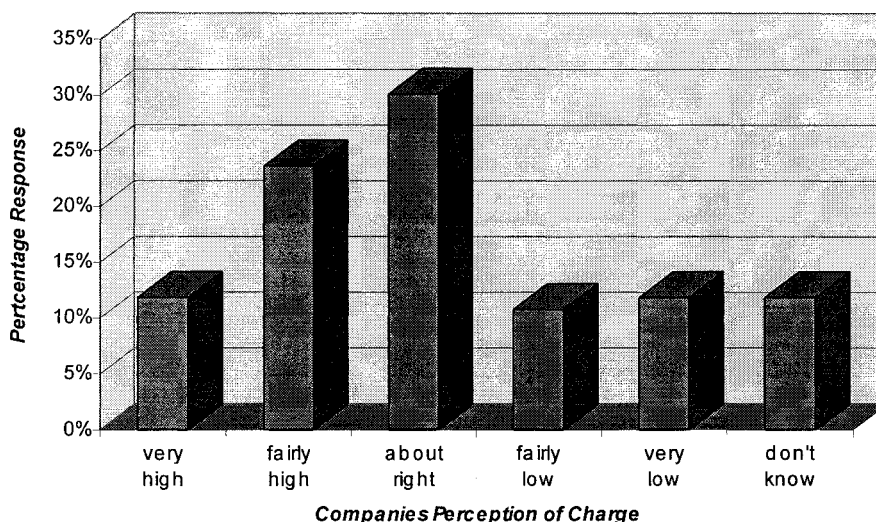


Figure 5 : Perception Of Cost Of Consent

- ❑ Just 25% of those surveyed perceived that the charge provided a financial incentive for altering discharge volumes, the figure being 23% for changing the nature of discharge (see Table 3). Only 11% and 6%, respectively, thought that the charges were highly significant.

Table 3 : Financial Incentives From Current Discharge Consent Charges

Response	Financial Incentive to Change Volume	Financial Incentive to Change Load
No incentive	48%	57%
Insignificant	22%	12%
Significant	14%	17%
Highly Significant	11%	6%
No Opinion	5%	7%

- ❑ Of those companies who had actually undertaken measures to alter their discharge, only 20% who changed quantity discharged, and 17% of those who changed the nature of the substances discharged cited the charges themselves as an influential factor in their decision making (Tables 4 and 5).

Table 4 : Main Drivers In Influencing Changes Quantity Of Water Discharged

	Very Influential	Fairly Influential
EA Charge	9%	11%
Cost of Waste Water Treatment	28%	17%
Environment Agency Pressure	25%	15%
Change in Process or Technology	25%	17%
Company Policy	42%	19%
Competitiveness Pressures	6%	21%
Cost of Other Raw Materials	21%	8%
Other Factors	17%	9%

Table 5 : Main Drivers In Influencing Changes In Load Of Water Discharged

	Very Influential	Fairly Influential
EA Charge	7%	10%
Cost of Waste Water Treatment	14%	10%
Environment Agency Pressure	38%	3%
Change in Process or Technology	14%	17%
Company Policy	34%	7%
Competitiveness Pressures	3%	7%
Cost of Other Raw Materials	3%	3%
Other Factors	17%	0%

- The limited incentive effect provided by the charge is reflected in the small proportion of turnover accounted for by the charge. Typically, it was found to be under 0.05% of most companies' turnover. However, there are distributional effects to the charges. For example, the current system appears to impact disproportionately upon small companies as charges make up a much larger proportion of their turnover (around 1%) when compared to larger firms.
- Comparison of the discharge costs with those for energy and solid waste disposal confirmed the relatively low cost of discharge. The perceptions of charges are shown in Figures 6 and 7. Discharge costs were typically below 5% of energy costs and up to 50% of waste costs.
- Out of the 93 companies interviewed both reviewed the costs of discharge consents, and had taken measures to alter water discharge. Of these 'good performers' only 27% budgeted for consents as part of overall expenditure and a similar number (27%) had no form of environmental initiative. Conversely a group of "poor performers" could also be identified. 27 out of the 93 companies did not review costs and had not taken measures to alter discharges. Of these companies almost 48% set budgets as part of total expenditure and 56% were not part of any environmental initiative.

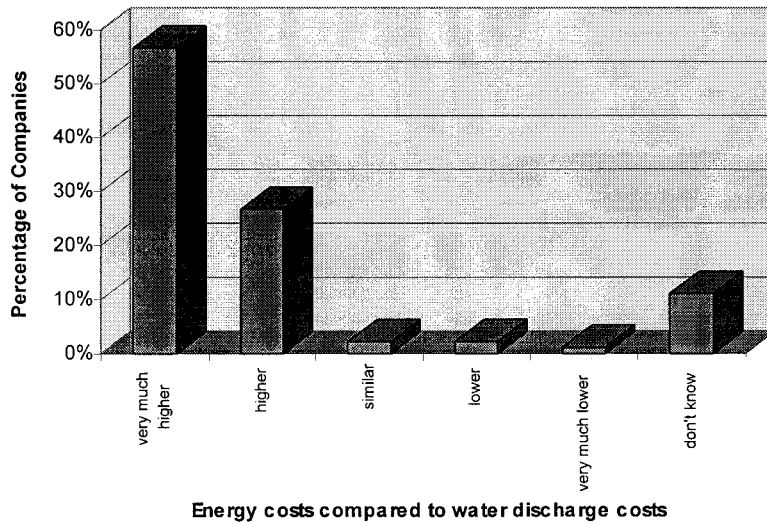


Figure 6 : Energy Cost Compared To Charge

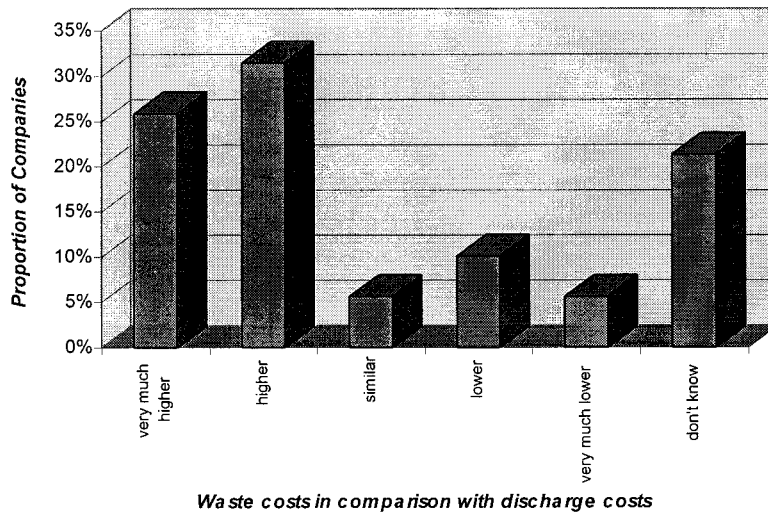


Figure 7 : Waste Disposal Cost Compared To Charge

The water companies expressed many sentiments that were similar to those held by the other companies surveyed. They expressed no strong opinions as to the level of the charge, but did question some aspects of how it was operated.

Companies questioned whether they were receiving value for money in terms of the level of monitoring service that they were receiving from the Agency and mentioned the length of time some consent applications/ variations took to determine. Another found the Agency’s billing information to be of limited value.

All companies agreed that the current charging system provided no incentive effect on the nature of the discharge. The one exception was the “Factor 14” charge multiplier, which

applies on the most dangerous substances. This creates incentives for companies to ensure that their treatment works discharges do not attract such a weighting.

RECOMMENDATIONS

The system of abstraction licence charging is currently having a minimal impact on companies' decisions to reduce water use, whilst the charges for discharge consents influence company decisions to a marginally greater degree. Yet in neither case is this what charging for abstraction licences was designed to do. They were designed as a mechanism for cost recovery. Many enterprises are aware of this and their perception of the level of charges is shaped by this knowledge.

Even if abstraction costs are successful in their cost recovery role, the survey raises questions as to whether the current level of regulation is sufficient to deter water users from breaching the terms of their licence. At least four companies were in breach of the terms of their licence. Furthermore, a number of companies (in abstraction and discharge modules) were dissatisfied with the service they felt the Agency was providing. Whether this in itself suggests the need for higher charges is a matter for debate.

There are good reasons to support moves to incentive based charging mechanisms designed to encourage more 'pro-environment' behaviour. The scope for increases in the charges as a means of achieving this end is quite significant (or so the survey would appear to suggest). However, the design of such schemes would have to be undertaken with great care. The existing schemes provide a framework for the management of the water resource. Changing the existing charging schemes might best be designed with their role in supporting the objectives of suitably altered licencing and consenting systems in mind.

A positive spin-off of any incentive-based charging mechanism might be that the quality of available information concerning water use increases. The information is not exactly as one might hope at present. A charging scheme based on quantities used might help, as in the Landfill Tax case, in the generation of improved data.

1. INTRODUCTION

1.1 This Report

ECOTEC is pleased to present this Final Report on the Effectiveness of Cost Recovery Charging to the Environment Agency. This report provides evidence from a survey of a sample of businesses subject to charges for abstraction licences and discharge consents. The study is particularly timely given the DETR's recent consultation exercise concerning the potential for using economic instruments to control water pollution, and given also the Agency's statutory obligations for reviewing the system of charging for discharge consents, and its review of abstraction charging.

The aim has been to understand the role played by licence and consent charges in motivating behavioural changes of an environmentally positive nature. The research provides an ideal opportunity to contribute to our understanding of how firms make decisions concerning water use, and the discharge to water of effluents. This may provide useful input to the development of policy instruments themselves, as well as pointing to an understanding of how complementary instruments could be designed so as to maximise the behavioural response of companies in the wake of the implementation of incentive-based instruments. The latter issue is particularly relevant from the perspective of the Environment Agency as regulator of the activities concerned.

1.2 Aims and Objectives of the Research

The aim of this research is to seek to understand the effectiveness of charging (designed to recoup the costs of administering the licence and consents system) in terms of making companies operate in a more sustainable manner regarding water use and pollution. Firms' decisions need to be understood as the outcome of a complex interplay of a variety of factors. These factors may themselves vary across firms, sectors and regions, and they are structured by the institutional framework within which they function. Broadly, it is the aim of this piece of research to shed some light upon:

- the significance of charging schemes, in terms of both their financial and management costs, to firms in the context of the operations of the firm or individual concerned ;
- the extent to which issues of water abstraction and effluent discharge are considered important by the companies and individuals concerned, and the degree to which this has a bearing on company behaviour ; and
- the reasons for variation in these factors, and the way in which they combine.

1.3 The Nature of Cost Recovery Charging Schemes

The responsibilities which the NRA possessed under the 1991 Water Resources Act were transferred to the Environment Agency under the 1995 Environment Act. The systems of charging for abstraction and discharge have different histories. The requirement for abstraction licences dates back to the 1963 Water Resources Act. Those abstracting water prior to this date were given protected rights through the award of licences of right (RSPB 1997). New licences are generally granted pending consideration of whether they will affect the rights of existing water users. Charges for abstraction were introduced in 1968 (CPRE 1993). Charges for abstraction licence applications and for consents for discharge into controlled waters were introduced much later. The Water Bill provided the NRA with powers to introduce a charging scheme, and consultations on the way in which such a scheme might be designed were held in 1989 (DoE and WO 1989).

The current scheme of abstraction charges was implemented in April 1993, whilst the current scheme for discharge consents started in April 1994. The latter scheme runs for five years and has to be reviewed before the end of March 1999. Coincidentally, a review of abstraction licensing is ongoing, though there is no statutory obligation to undertake this.

In neither case was it intended that the scheme would seek to internalise the environmental costs of the activities concerned (with respect to pollution, see DoE and WO 1989, 3). The aim is to recover the costs to the Environment Agency of issuing and monitoring abstraction licences and discharge consents and their impacts on source and receiving waters respectively. However, both schemes incorporate, amongst others, elements which could be assumed, *a priori*, to internalise at least in part, environmental costs. The question arises, therefore, as to the extent to which these charging mechanisms actually achieve improvements in environmental quality. The annual charge component of these schemes are outlined in Tables 1.1 and 1.2.

Table 1.1 : Cost Of Annual Charge For Environment Agency Abstraction Licences

Variable	Dimension of Variation
Volume Factor	Volume Stated in Licence, or, for spray irrigation, Volume Stated and Volume Used
Source Factor	Whether source is supported, unsupported or tidal
Season Factor	Whether abstraction occurs during winter, summer, or all year round
Loss Factor	Purpose for which water is authorised to be used
Standard Unit Charge	Varies by region

Table 1.2 : Cost Of Annual Charge For Environment Agency Discharge Consents

Variable	Dimension of Variation
Volume	By volume band
Content	By substance discharged
Receiving Water	Whether receiving water is groundwater, surface, coastal, or estuarial water,
Unit Rate	Financial factor

In addition to the annual charge, the schemes levy an application charge each time a new application is made, or when changes to an existing licence / consent are sought.

Companies who employ processes regulated under Integrated Pollution Control (IPC) are charged on a similar basis for their discharges, but because they are obliged to involve themselves in self-monitoring, their charge for discharge consents is 56% of what it would otherwise be. We understand that this component of the total IPC charge appears as a separate line on companies' invoices from the Environment Agency.

1.4 Research Design

Through consideration of the factors affecting firm behaviour (see Section 2.0 for a full discussion), we have identified as key issues those listed in Table 1.3. In the light of these, two surveys have been designed with the aim of eliciting the nature of firms' responses to the two charging schemes (abstraction licences, and discharge consents) in place. The questionnaires are to be found in Annex 1.

As noted above, some companies which discharge pollutants to water are regulated under IPC. Some of these have had their consents superseded by authorisations, in which case, since they themselves pay for the local monitoring of discharge, they pay only 56% of what they would pay under the current discharge consent charging scheme (this being for monitoring of the receiving waters). This is included as a separate line on their invoices. Those who have not had their consents superseded simply pay for their consents as under the current charging system. Given the importance of IPC companies in our survey, we have sought to sample some of these.

The two surveys would ideally have been stratified (and related back to the population) by :

- region of water scarcity / plenitude (accepting that this is likely to be a concept with significance at the local level, as well as the regional level);
- regions of high / low charge (in relation to abstraction licences);
- sector;
- size of the firm concerned;
- and size of abstraction / discharge (especially with respect to charge bands in the case of consents).

Table 1.3 : Factors Influencing Firm Behaviour And Implications For Survey

<i>Factors affecting firm behaviour</i>	<i>Implications for survey</i>
Awareness of options for water supply/effluent discharge	question
Possibilities for obtaining / changing licence/consent	Survey in regions of scarcity and regions of plenitude
Position in charging scheme relative to exceptions	Survey, as far as possible, by volume abstracted / discharged
Role of intermediaries	question
Cost of obtaining / changing licences and consents in absolute and relative (to total costs) terms	questions
Asset value of licence and strategic issues	question / split between regions of scarcity and regions of plenitude and regions of high cost and low cost for abstraction
Who (internal to a firm) deals with obtaining / updating / compliance?	question
How often are costs examined?	question
Firm size	Stratify by firm size (employees) - question
Sector	Stratify by sector - question
Seasonality of requirements	question
Compliance efforts	questions concerning awareness of penalties and issues of environmental management
Awareness of alternative process technologies	question
Issues associated with industrial location	question
Investment cycles	question
Competition	question
Effect of application charge	question
Negotiation of licences /consents	question
Abstraction - discharge interdependencies	request that companies answer both questionnaires / questions specific to abstraction / consents survey

Each of these is considered below.

A&B Regions of Scarcity / Plenitude and Regions with High/Low Standard Unit Charge (SUC) (for abstraction)

Regions of apparent water scarcity and plenitude have been identified with the help of Agency staff. These have been identified as :

<i>plenitude</i>	:	Northumbria, Wales,	North West,	South West,
<i>scarcity</i>	:	Anglian, Thames,	Southern,	Yorkshire,

The SUCs associated with abstraction from Agency regions do not necessarily reflect relative plenitude or scarcity of the resource at the regional level. It was decided, given the variation in SUCs for abstraction, to choose regions of high and low SUC covering regions of plenitude or scarcity as shown in Table 1.4.

Table 1.4 : Sampling Regions By Scarcity / Plenitude, And High / Low Suc (Standard Unit Charge For Abstraction)

	High SUC	Low SUC
Plenitude	Northumbria	Wales
Scarcity	Anglian	Yorkshire

Northumbria and Yorkshire are both in the Environment Agency North East region. Locational effects could be expected to be particularly strong here since the neighbouring regions are in the highest and lowest standard unit charge areas respectively.

C Sector

Originally, the abstraction sample had concentrated on water supply companies and spray irrigators, whilst the discharge consent sample was concentrated on water service companies and the electricity supply industry, as well as the following sectors:

- fish / cress farming ;
- food and drink ;
- chemicals ;
- textile manufacture ; and
- pulp and paper.

The selection of these sectors was based on abstraction data and data on waste water treatment expenditure.

Given that there may be links between the two processes, abstraction and discharge, it was felt that there would be something to be gained from interviewing companies who held licences and consents to try to capture such linkages. Evidently, such linkages are less likely to be present in the case of spray irrigation and water supply (only) companies, which would be considered only in the abstraction licences module. The survey sample as originally intended is shown in Table 1.5.

The limitations on data availability are not inconsiderable. The information held on Public registers is available principally in hard copy form. However, Regional offices of the Environment Agency hold some data in electronic form as regards both abstraction licences and discharge consents. The key problems associated with this data as regards this survey are that the data is not held in a form whereby licence / consent holders are identified by their sectoral origin. Companies are identifiable principally on the basis of the purpose for which the water is used. Typically, it is possible to identify through the purpose categories (from the abstraction and discharge databases) :

- fish farms (though this category tends to include angling clubs too);

Table 1.5 : Intended Survey Sample Frame

Sector	Abstraction Interviews	Discharge Interviews
Identifiable Sectors		
Water Service Companies	4	4
Water Supply	4	
Electricity Supply	4	4
Spray Irrigation	40	
Fish Farming	20	8
Grouped Sectors¹		
Textiles	12	22
Chemicals	12	22
Pulp and Paper	12	22
Food and Drink	12	22
TOTAL (224)²	120	104

¹ *The sectoral distribution of the grouped sectors in a given region will be determined in part by regional industrial concentration. Subject to this, approximately 30 and 26 abstraction and discharge interviews, respectively, will be held in each of the four regions.*

² *Lapsed Applications We also asked the respondents whether they had considered applications for licences or consents but had subsequently decided not to go through with the process. there were a number of such occasions in both abstraction and discharge surveys.*

- holders of spray irrigation licences (not all of which, as we found, are related to agriculture);
- users of cooling water; and
- water companies.

Some of the actors falling within our sectoral breakdown are, therefore, more or less easily identifiable.

Beyond these categories, however, we were constrained in our ability to identify companies in terms of their sectoral origin. We asked regional offices of the Environment Agency to supply us with names of companies (and relevant contacts where possible) with abstraction licences and discharge consents relating to purposes which would be expected to be those carried out by companies from the sectors we were interested in. From the lists obtained we sought to identify the companies to be surveyed on the basis of their title (to the extent to which this is suggestive of their sectoral origin, or where this is known by virtue of their being household names). Particularly in the textiles and pulp and paper sectors, this yielded inadequate information. We therefore supplemented our information from the Agency offices with lists of companies from trade associations, and selected those which fell in the relevant regions. Companies were also screened for their sectoral origin when interviews were arranged.

D&E Size of Firm Concerned and Size of Abstraction / Discharge Relative to Exemptions / Charge Banding

Within the electronic databases of the regional Agency offices, there is data on the licensed volume of water available for abstraction under each licence, and some data on maximum consented discharge volumes under consents. In the former case, however, actual use is not given, and in the latter case, some companies have no such data attached to them. As far as possible (in some cases, the population from which we were selecting was not itself a limiting factor), we chose a random selection of companies with large, medium and small abstraction/discharge volumes.

1.4.1 Water Companies

The water company interviews were carried out on a face to face basis and included 4 water service companies and 3 water supply companies in the regions under consideration. The results are reported in Section 2.0 abstraction licences and 3.0 discharge consents, respectively. Evidently, the water supply companies are only of relevance for the abstraction side of the equation (although they have some involvement in waste water treatment through historical arrangements).

2. FACTORS LIKELY TO INFLUENCE THE EFFECTIVENESS OF COST RECOVERY CHARGING

Given the charging schemes outlined above, there are a number of issues which are likely to affect firm behaviour. These include, but also go beyond those factors which directly affect the level of the charges levied by the Agency. In order to understand what these are, it is useful to relate decisions made by the firm to the process of applying for licences or consents and indeed, to the nature of the decision-making process of the Agency itself in deliberating over the award of licences and consents.

What we perceive to be key issues can be identified through consideration of questions concerning

- *whether or not actors decide to apply for licences / consents, itself related to their knowledge of options;*
- *the costs of applying for and maintaining compliance with licences / consents ;*
- *the annual costs of licences in the context of the companies overall costs ;*
- *the way in which costs are reviewed / reported and the opportunities which companies perceive for reducing their exposure to the financial costs of licences / consents;*
- *any dynamic effects of charging schemes (through year-to-year changes); and*
- *any locational issues related to the charging scheme (relating to place-to-place variation in charges).*

On the basis of discussions with Agency staff and our own analysis of the issues, we have identified what we believe to be the factors of greatest significance for this research project. These are outlined below, and related to the survey instruments. For the purposes of clarity, and reflecting the terms of reference, we follow a modular path from here on.¹

2.1 Abstraction Licences

2.1.1 Whether to apply and knowledge of options

Key to whether or not a firm applies for an abstraction licence, and affecting its decisions to continue with current arrangements is its awareness of the options available to it. Although for spray irrigators, there may be a choice as to whether to be charged on the basis of a two-part tariff,² in most cases, the principal option is use of water supplied by private companies. The question arises as to what determines whether a company will seek an abstraction licence rather than rely on the services of water companies. This is likely to relate to questions concerning:

- awareness of water use options and their availability;

¹ We have included the equivalent text on abstraction to indicate the issues likely to be examined in that module.

² In which the operator can choose to have 50% of the charge levied on actual volume used, and 50% on the basis of the volume stated in the licence.

- the fixed and variable costs of equipment used for water abstraction and the financial and management costs associated with maintaining a licence, as compared with the costs of water supply from supply companies;
- the likelihood, as perceived by the actor concerned, of obtaining a licence from the Environment Agency, which may vary according to the relative scarcity of water supply relative to current use (itself partly a function of the licences already granted), as compared with the (management and other) costs of preparing an application; and
- the degree to which a licence assures the holder of the availability of a given volume of water (the age of the licence may be an issue here).

As regards b), it is generally believed that the costs of abstracted water are far less than that from water supply companies. In addition, there are a number of exceptions where abstraction can take place without a licence. These include:

- one-off abstractions up to 20 cubic metres (subject to Environment Agency consent if greater than 5 cubic metres);
- abstractions of 20 cubic metres or less per day from a surface water source running through or bordering an abstractor's land for domestic or agricultural purposes other than spray irrigation;
- abstractions of 20 cubic metres or less per day from underground strata for the domestic purposes of one household;
- land drainage;
- abstraction to test for the presence, quality or quantity of water (with Environment Agency consent) in underground strata;
- water used for fire-fighting; and
- other cases.

Certainly, the exceptions a, b, and c would appear to offer strong incentives for those operating at the margin of these exceptions to risk not applying for licences since the marginal cost of their usage above and beyond that which is exempt would be considerable. For example, for daily usage of 20 cubic metres of surface water for agricultural purposes in the Anglian region, the charge would (if not exempt from charging) be $365 \times 20 \times 1 \times 0.6 \times 14.3 = \text{£}62,634$. Moving into the area of activity where abstraction licences were required would clearly be a major financial decision. Conversely, the charging exceptions constitute a moral hazard for those operating at their margin.

There are other influences on companies' decisions as to whether or not to apply for an abstraction licence. Amongst these are quality issues. Water may be required to be of a sufficient purity for use and this level of purity may not be assured through water abstracted from controlled waters. The costs of water treatment may be deemed too high for the company to pay for itself.

2.1.2 Information Regarding Application

Once the decision has been made to apply for an abstraction licence, the question arises as to how the actor involved proceeds. A number of parties may be involved including the applicant, the local licensing officer, and possibly, an intermediary acting on behalf of the

applicant. In pre-application discussions, and in preparing the information for an abstraction licence, it may transpire that the chances of an application succeeding are likely to be slim. During this pre-application phase, the applicant is likely to have to familiarise him/herself with the charging structure. These processes are unlikely to be costless. Once the decision to apply has been made, there may be a process of negotiation taking place between the Agency and the applicant. Again, the process is unlikely to be without cost to either party.

2.1.3 Monitoring Compliance

The cost of companies complying with the terms of their licence depends on the extent to which this requires them to install and maintain capital equipment for the process of monitoring. It will also depend on the time devoted to managing the compliance process. Of course, it is possible that companies may simply decide not to comply. As mentioned above, this would appear to depend on the trade-off between the costs and benefits of complying, or not complying.

2.1.4 Dynamic Effects of Charging Scheme

Since the annual charge associated with a given licence is proportional to the volume extracted, one might expect that this would constitute an incentive to reduce water abstraction. This would require a change in the licence. However, abstraction licences may have value in themselves as an asset attached to particular parcels of land, and the asset value might relate to the volume expressed in the licence, as well as to the relative scarcity of water available for abstraction, the period for which the licence is granted, and also, on the fact that in any purchase of land, a buyer can succeed to the licence. This is likely to be a particularly important issue for agriculture where changes in crop mix (and water use) might occur over time, and where the oligopsonistic power of retailers may allow them to make the holding of an abstraction licence a condition of their contracts (for reasons associated with maintenance of product quality).

Therefore, the incentive to reduce volumes licensed for abstraction may be less than might appear from a superficial look at the charging scheme.³ The volume which could be abstracted as determined through abstraction licences may be much higher than the actual level of water use. The Agency does undertake steps to ensure that abstraction licences are not completely out of line with volumes used, but if the Agency wishes to reduce licensed volumes, it may have to compensate the licence holder, especially in the case of older licences which are licences of right.

2.1.5 Perception of Charges Within the Company

Much of the way in which firms respond to the charges can be expected to be shaped by the way in which they are perceived within the company. This is likely to depend on the magnitude of the charges, or their perceived significance, relative to overall company costs. It

³ Incidentally, this would appear to raise serious questions as to the efficacy of a tax which sought to achieve a more efficient allocation of water resources amongst potential users. To the extent that the allocation of abstraction rights precludes their uptake by those who might wish to use water, inefficiencies will result from the ossification of the system of use.

is also likely to bear some relation to the possibilities which companies see for reducing their water use on a continuous basis. In this respect, it may be useful to understand :

- how companies perceive the opportunities for reducing water use on a continuous basis. Abstraction costs may be most effective where the company is aware of ways of reducing abstraction which are both cost-effective, and enable it to change abstraction volumes significantly (using e.g. membrane separation technologies). In such a case, the company could change its licensed volume (assuming the change does not affect its asset value). In such instances, the firm may be able to gain financially and / or through an increase its reputational utility (from positioning itself as a ‘green company’);
- what percentage of company turnover is accounted for by water abstraction. Presumably, where charges account for a low percentage of total turnover, the effect of the charges would most likely be limited; and
- how the costs of water abstraction compare with, say, those of energy use and waste disposal (although our experience suggests that obtaining one of these - that for waste disposal - is not straightforward, and that individuals who are most knowledgeable about abstraction / discharges may not be the best people to consult regarding energy and waste disposal costs). This would shed some light on the relative financial stimulus provided for minimisation of each (and also the relative stimulus that would be expected from *ad valorem* changes in costs).

The charges for water abstraction have changed over time. So has the duration for which they are granted. There may be effects on company behaviour which occur through periodic changes in the cost of abstraction licences. Therefore, it is important to know how these charges have evolved over time.

One might also expect some variation to relate to internal management structures. How is responsibility for dealing with licences distributed within a company, and at what levels of management are issues related to licences reported? How knowledgeable are the company’s board, or owners, concerning water-related issues.

2.1.6 Location Issues

Because there is variation in the standard unit charge for abstraction across regions, and because water abstraction charges are related to the nature of the source, then to the extent that water abstraction costs are treated as significant by companies, one might expect to see abstraction charges affecting location. The sorts of response which might be observed in this regard under the current charging structure are:

- a company relocates, or chooses to locate, in a lower charge region, or an area where abstraction takes place from a different source;
- water is abstracted from one region, or type of source, and piped to another region or area where abstraction from a different source would usually be necessary; and
- a company faced with the need to scale back operations through site closures chooses to close the site where abstraction costs are highest.

It is interesting to note in this regard that SUCs do not reflect water scarcity (at least at the region-wide level at which they are set). Indeed, high SUCs, such as those in Northumbria, reflect a requirement to recoup the cost of infrastructure (reservoirs) which in the case of Northumbria has been constructed on the basis of projections for water use which are too high. Hence, a high SUC coincides with plentiful water. Conversely, neighbouring Yorkshire faces relative scarcity of supply and would like to transfer water from Northumbria to Yorkshire. However, the plentiful supply in Northumbria, which Northumbrian charge payers feel they are paying for, is potentially of value in attracting investment from companies planning to locate in the Northeast, especially those which have requirements for reliable supplies of large volumes of water. Currently, therefore, companies may be locating in regions where investment in water supply has been greatest. Here, if one moves away from the purely 'pricist' view of behaviour, one may find that the attempts to minimise water use might be least (owing to the security of supply) where the SUC is highest (a consequence of investments in supply).

The final locational issue of significance may be the position of the licence holder relative to Sewage Treatment Works with good returns to surface waters. The reliability of supply may be enhanced for companies downstream of such plants.

2.1.7 Seasonal Issues and Loss Factors

Because the abstraction charge depends on the season during which abstraction takes place, and on the loss factor attributable to different purposes, there may be other ways in which companies may have incentives to alter their behaviour.

the company alters the seasonal nature of its abstraction. In practice, this seems relatively unlikely to occur given the costs of storage, as well as the likely implications for operating capacity, and in agriculture, on the very nature of the enterprise; and the company changes its process to alter its loss factor.

These issues will be examined in the survey since potentially, there are positive environmental effects associated with a switch to the lower charge categories.

2.2 Discharge Consents

2.2.1 Whether To Apply And Knowledge Of Options

Key to whether or not a firm applies for a discharge consent, and affecting its decisions to continue with current arrangements is its awareness of the options available to it. In the case of discharge of effluents, companies can choose either to apply for a consent, or to discharge effluents to sewer or tanker effluent away for treatment and disposal. The question arises as to what determines whether a company will choose to apply for a consent rather than rely on the services of water and waste companies. This is likely to relate to questions concerning:

- awareness of the options available;

- the fixed and variable costs of equipment used for effluent treatment and the financial and management costs associated with maintaining a consent, as compared with the costs of treatment, discharge to sewer and tankering away for off site treatment;
- the conditions attached by water service companies to effluent discharge;
- the likelihood, as perceived by the actor concerned, of obtaining a consent from the Environment Agency, which may vary according to the condition of the receiving water (itself partly a function of consents already awarded), as compared with the (management and other) costs of preparing an application. In this context, it should be noted that the Agency is seeking to encourage discharge to sewer, but at the same time, some water service companies are reluctant to have to deal with certain discharges;
- the availability of infrastructure, not all areas are connected to mains sewers or proximate to controlled waters ; and
- the nature and volume of the discharge (certain types of discharge, such as cooling water, would not usually go to sewer, as they are relatively clean discharges, and large in volumetric terms).

There is only one exemption from the annual charge, and this relates to discharges of sewage effluent of 5 cubic metres or less per day. Some consents are awarded for activities which tend to involve stochastic and unpredictable discharges, for example, storm overflows. In these cases, the licence holder will pay for the consent, but be refunded if no discharge has occurred in the relevant period. A reduced application charge is applicable in this case, as well as for trade effluent from cooling or heat exchange where the proposed volume is 10 cubic metres or less per day, and for surface water not containing trade effluent.

Our understanding of the process is that few companies actually submit applications for consents without prior consultation with Agency representatives. Negotiations can be long and protracted and increasingly, focus on finding innovative solutions working in partnership with the would-be applicant. Thus, few make formal applications that are likely to fail because much of the detail has been settled in advance. Very few of those interviewed have been faced with making the kind of decision of whether or not apply for a consent. The vast majority have relicensed existing discharge practices, either making legal an illegal discharge, or adjusting consents to reflect new process conditions.

2.2.2 Information Regarding Application

Once the decision has been made to apply for a consent, the question arises as to how the actor involved proceeds. A number of parties may be involved including the applicant, the local licensing officer, and possibly, an intermediary acting on behalf of the applicant, who might be a consultant or a person involved in the supply of water treatment equipment. In pre-application discussions, and in preparing the information for a consent, it may transpire that the chances of an application succeeding are likely to be slim. During this pre-application phase, applicants are likely to have to familiarise themselves with the charging structure. These processes are unlikely to be costless. Once the decision to apply has been made, there may be a process of negotiation taking place between the Agency and the applicant, which could cover a number of issues relating to the terms of the consent. Again, the process is unlikely to be without cost to either party.

In considering its application for a consent, a company is likely to become aware of the charging structure. The banded nature of the charge for consents means that there are incentives for those marginally above the cusp of a particular band either to reduce their discharge (or change its content), or alternatively, to misdeclare their level of discharge (or its content), so as to fall in a lower band. A combination of the benefits which accrue, and the costs incurred, of staying in the lower band as opposed to the higher will determine whether the banding system effectively influences the distribution of companies by volume discharged.

2.2.3 Monitoring Compliance

The costs incurred by companies in complying with the terms of their consent depend on :

- the extent to which this requires them to install and maintain capital equipment for the process of monitoring;
- the extent to which those with consents are required to spend time managing the compliance process; and
- the company's perception concerning the likelihood of its being prosecuted for non-compliance, and the size of the penalty that it stands to incur as a result.

This latter issue raises an interesting question. The extent to which companies might be encouraged to flout the existing scheme might be deemed to be a function of the perceived probability of being caught, the perceived probability of being penalised once caught, and the penalty itself (see e.g. Popovic et al 1997), which is likely to have financial and reputational origins (the latter frequently having indirect financial consequences - see e.g. Tietenberg 1997).

If Environment Agency charging covers the costs of monitoring and inspection, lower/higher charges would imply lower/higher levels of monitoring activity. This, in turn, would appear to imply a lower/higher probability of being caught. A crucial factor in determining the level of the charge, therefore, would be whether the Agency feels it has in place the correct level of monitoring.

Low charges (less stringent monitoring) would be expected, other things being equal, to result in a higher level of illegal activity than would be the case with higher charges and more stringent regulation. Higher charges might be deemed unwarranted or undesirable on economic grounds, yet would, or so it seems likely, strengthen any existing incentives towards reduction in water use or effluent discharge, as well as providing greater funds for regulatory activity.

2.2.4 Dynamic Effects of Charging Scheme

As mentioned above, there are incentives for companies to move from a higher band to a lower one, especially where they are close to the lower band. Similarly, companies expanding operations have an incentive to maintain discharge within their existing band, not only

because of the increase in the annual charge but also because of the administrative charge and negotiating costs which would be incurred. Much will depend on the savings that can be made through moving into / staying in a lower band, compared with the costs of achieving the necessary changes in production process. The way in which the charge changes in different bands is shown for the maximum and minimum scenarios in Table 2.1 and Figures 1 and 2.

Table 2.1 : Variation Of Charge With Consented Volume

Daily Volume of Discharge (cubic metres)	Upper Limits of Charge for Given Volume (£)	Lower Limits of Charge for Given Volume (£)
5	2614.5	18.675
5.01	4357.5	31.125
20	4357.5	31.125
20.01	8715	62.25
100	8715	62.25
100.01	17430	124.5
1000	17430	124.5
1000.01	26145	186.75
10000	26145	186.75
10000.01	43575	311.25
50000	43575	311.25
50000.01	78435	560.25
150000	78435	560.25
150000.01	122010	871.5

The way in which firms respond to the charges can be expected to be shaped by the way in which they are perceived within the company. This is likely to depend on the magnitude of the charges, or their perceived significance, relative to overall company costs. In this respect, it may be useful to understand the relative significance in company costs of, for example, energy use, and waste disposal costs, and we have sought to elicit such informations in questionnaires.

The sorts of response which might be observed in this regard under the current charging structure are:

- because the volume-based factor is based on banding of discharge volumes, there would be incentives for behavioural change especially where the enterprise concerned is functioning at a discharge level which is close to the lower bounds of a given band. It is possible that, as in the case of abstraction, the company finds a way of reducing discharges significantly, possibly with improvements in its bottom-line, or with increases in its public profile (e.g. re-using cooling waters);

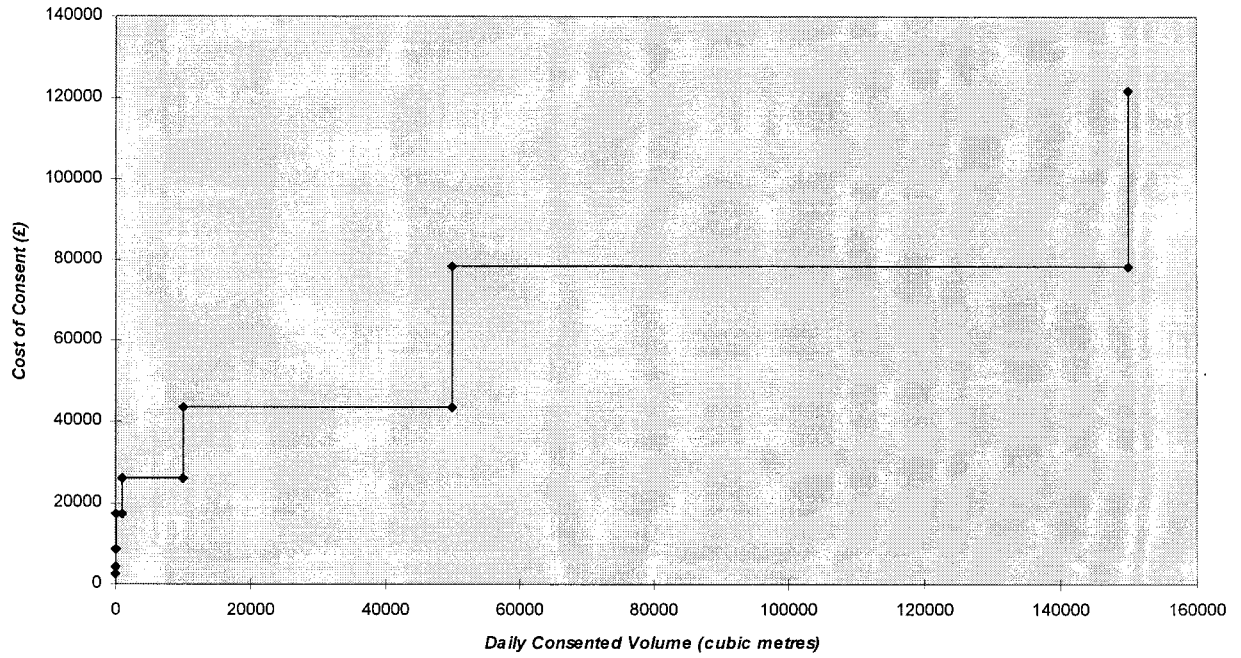


Figure 1 : Variation Of Charge With Consented Volume (Maximum Within Band)

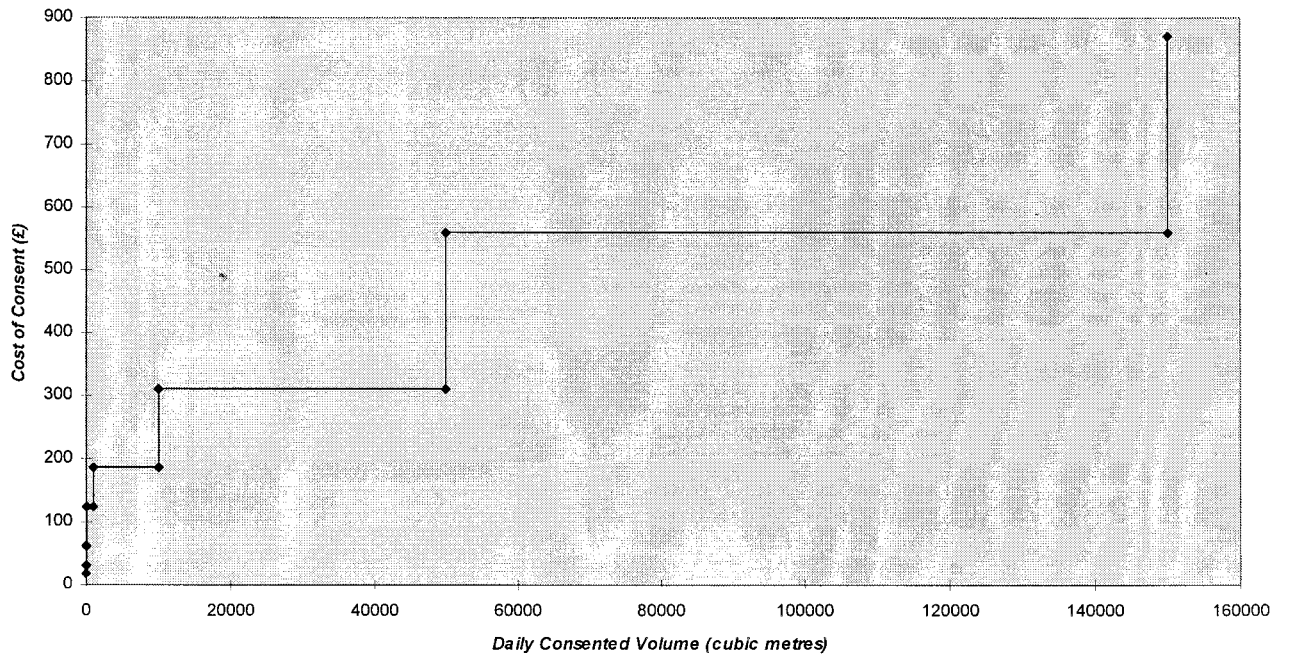


Figure 2 : Variation Of Charge With Consented Volume (minimum within band)

The company could seek to change the nature of what it is discharging, for example, moving from solvent-based to water-based agents in the production process (e.g. switching from organic solvents to aqueous solvents for plant washdown); and in theory, the company could seek to alter the receiving source, either through infrastructural investment or other means. The relative costs of the capital investment and the charge (discounted over time) are relevant issues in this regard and seem likely to mitigate against such a course of action.

It might also be the case that this type of response is prompted at the pre-application phase when companies become aware of the structure of charging for abstraction. It is important to understand (where these types of change have occurred) the extent of the influence of the charging scheme.

3.0 EFFECTS OF CHARGING FOR ABSTRACTION LICENCES

3.1 Survey Sample

The aim of the abstraction module was, as mentioned above, to survey firms in a variety of sectors across the four chosen regions. Table 3.1a shows the extent to which the survey sample frame was achieved in the survey undertaken. The survey sample is shown, broken down by size (turnover and employees) in Figures 3.1 and 3.2 (the sectoral breakdown is given in Table 3.1). As shown in Table 3.1a, the survey is slightly light in three regions, but this is compensated for by extra interviews in the Yorkshire area. In terms of sectors, the total coverage is close to that intended. There are fewer from agriculture than was planned, but some of the spray irrigators were found to be leisure facilities, such as golf clubs (hence, 6 surveys from recreation).

The split by employee size helps to show how many of those interviewed were small operations, especially those in the agriculture and fish farming sectors (the farming sectors). By turnover band, the distribution was somewhat more even.

It is not straightforward to relate the sample to the total population. By sector, the information from Agency offices simply does not enable us to do this for reasons some of which have been mentioned above. What we have sought to do in Table 3.1b is relate the abstraction interviews undertaken to the total that could have been undertaken in each region. The coverage is good for what appears, on the face of it, to be a small sample.

The survey results are presented below in the following sections :

- Environmental Awareness
- Division of Management Responsibilities
- Setting Budgets For, and Reviewing the Costs of Licences
- Asset Value of Licences
- Perception of Charge Level
- Awareness of Reasons for Paying
- Knowledge of Costs and Size of Costs Relative to Turnover and Other Expenditure Items
- Incentives for Changing level of Water Use
- Attitude Towards Unit Charging
- Enterprises Considering Applying for Licences But Not Doing So
- Results from Water Companies Survey

We conclude with a comments section before presenting conclusions in Section 5.0.

Table 3.1a : Actual Surveys Undertaken Set Against Survey Sample Frame

	Type of Organisation	Anglian Region		Welsh		Northumbrian		Yorkshire		Other		Total	
		Actual	Target	Actual	Target	Actual	Target	Actual	Target	Actual	Target	Actual	Target
3	Power Generation	1	1	0	1	2	1	1	1	0	0	4	4
4	Chemicals	5	4	2	3	4	3	5	3	1	0	17	13
5	Textiles	0	3	1	3	0	3	10	3	0	0	11	12
6	Pulp and Paper	1	0	4	3	2	3	5	3	1	0	13	9
7	Food and Drink	6	5	4	3	5	3	2	3	1	0	18	14
8	Fish or Cress Farming	4	5	5	5	2	5	7	5	0	0	18	20
9	Agriculture	7	10	5	10	5	10	9	10	1	0	27	40
10	Recreation	1		4		1		0		0	0	6	
11	Other	1		0		3		0		0	0	4	
	Total	26	28	25	28	24	28	39	28	4	0	118	112

Table 3.1b : Actual Surveys Undertaken Against Number Of Licence Holders By Agency Region

Type of Organisation	Anglian Region	Welsh	Northumbrian	Yorkshire	Other
Power Generation	1 interview 17 licences for evaporative cooling held by 13 companies, 2 of which were power companies. 50% of potential respondents	0 interviews 6 licences for non-hydro-electric electricity supply. At most five holders. 0% of potential respondents	2 interviews 3 licences for direct cooling held by two different entities 67% of potential respondents	1 interview Estimate of two different holders (from direct cooling list) 50% of potential respondents	4 interviews
Other industry	12 interviews 405 licences in total held by an estimate 250 companies Estimated 5% of potential respondents [†]	11 interviews 269 Other Industry licences plus 20 for through cooling (not electricity generation) held by an estimated 150 holders. Estimated 7% of potential respondents [†]	11 interviews 436 licences in Industry and Direct Cooling. 247 had data, and these belonged to 119 licence holders. Estimated 9% of potential respondents [†]	22 interviews 112 companies holding 138 cooling/general industrial licences. 553 General Industrial licences held by an estimated 400 holders. Estimated total of 450-500 holders. Estimated 4-5% of potential respondents [†]	3 interviews

Fish Farming	4 interviews 57 licences in total held by 54 holders 7% of potential respondents	5 interviews 65 licences held by 52 holders 10% of potential respondents	2 interviews 17 valid licences held by fourteen different holders 14% of potential respondents	7 interviews 43 licence holders 16% of potential respondents	0 interviews
Spray irrigation	8 interviews. Given the large number of abstraction licences for spray irrigation in Anglian region, we asked the Agency to provide samples within three areas of the region. We randomly selected from these. Estimate of 0.5% of potential respondents	9 interviews 656 licences held by 529 holders 2% of potential respondents	6 interviews 193 licences on database, several of which have been cancelled. An estimated 120 are valid, held by an estimated 100 holders. 6% of potential respondents	9 interviews 966 licences for spray irrigation held by 866 distinct entities. 1% of potential respondents	1 interviews
Other	1 interviews	0 interviews	3 interviews	0 interviews	0 interviews
Total	26 interviews	25 interviews	24 interviews	39 interviews	4 interviews

¹ These are minimum estimates of the percentage of potential respondents interviewed since we restricted ourselves to certain sectors whereas the number of potential respondents as stated in this area includes all industrial sectors.

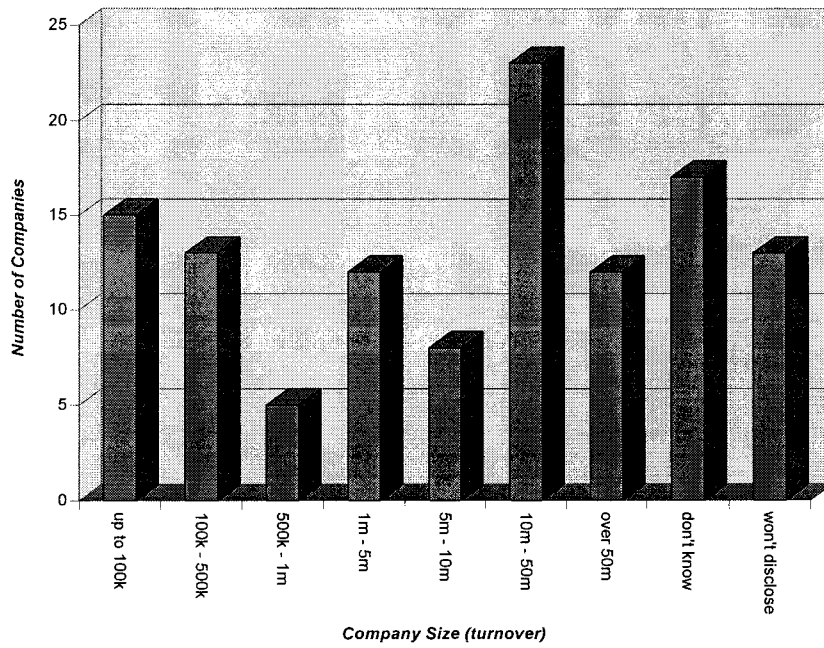


Figure 3.1 : Survey Sample Broken Down By Company Size (Turnover)

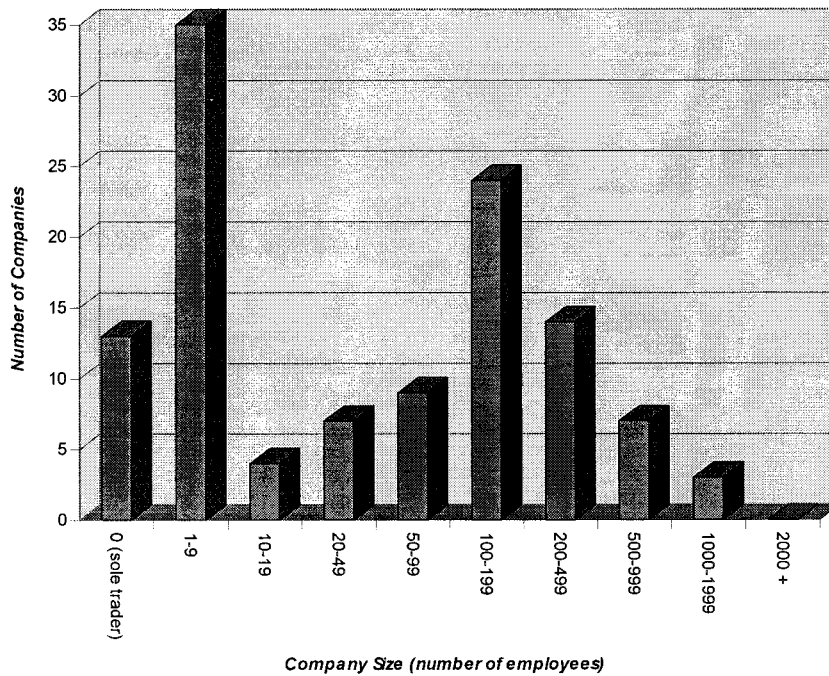


Figure 3.2 : Survey Sample Broken Down By Company Size (employees)

3.2 Environmental Awareness

3.2.1 Involvement in Environmental Management Schemes (EMS)

Of the 118 firms responding, 65% belonged to no environmental management scheme. Of those that did, more than three quarters (or 27% of the total sample) belonged to just one scheme, whilst just under a quarter (8% of sample) belonged to more than one (see Figure 3.3). The most popular scheme named was ISO14001, with 7% of all responses (8% of respondents) belonging to this scheme. 22% of responses (25% of respondents) were from companies who claimed to be following 'other schemes' from those offered (see Figure 3.4). Several of these were looking for accreditation with approved schemes in the near future or were modelling their own schemes on the basis of these. We included within our survey schemes such as environmental business clubs which are not accredited schemes as such.

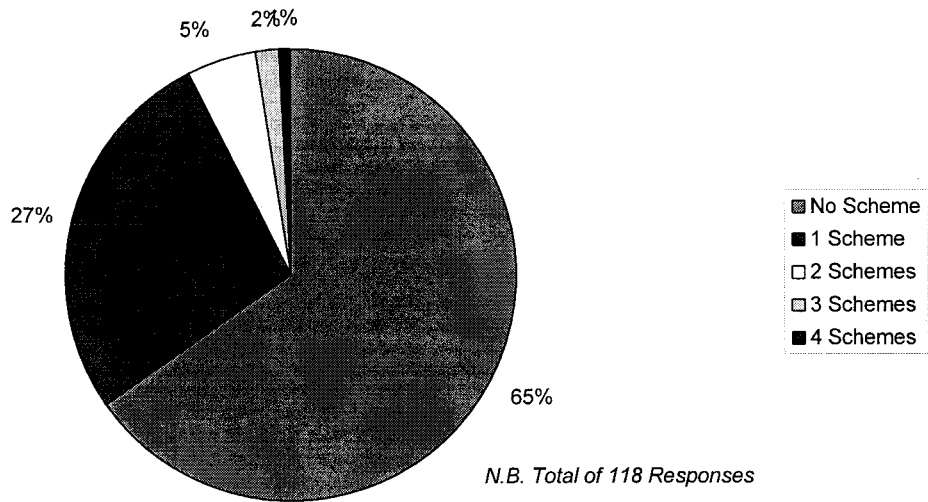
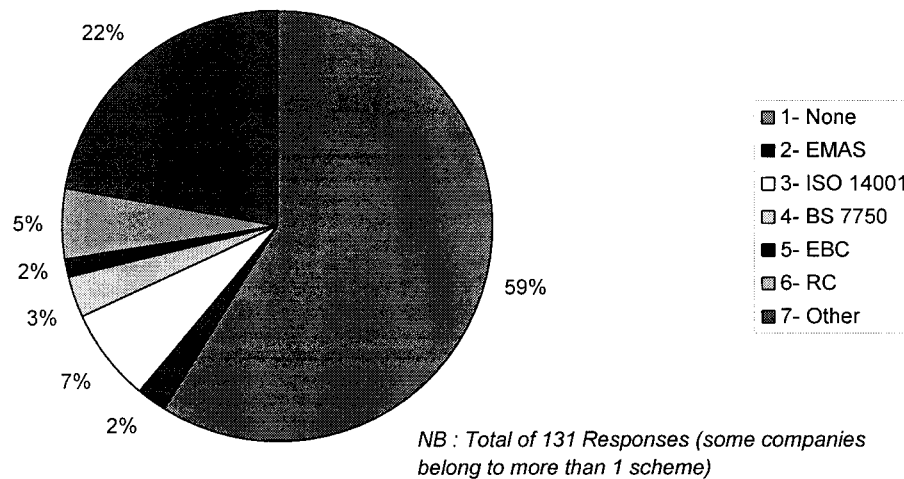


Figure 3.3 : Number Of Environmental Management Schemes By Company

3.2.2 Environmental Reporting

Of the 115 companies responding, 31 (or 27%) produced environmental reports, whilst the remaining 84 (73%) did not. Interestingly, of those that did produce reports, 10 were companies who followed no environmental management scheme.



Note : BS 7750 has been subsumed within EMAS
 EBC = Environmental Business Club
 RC = Chemical Industry Association Responsible Care

Figure 3.4 : Survey Sample Split By Environmental Management Scheme

3.2.3 Environmental Management Schemes and Reporting

Overall, more companies were members of environmental management schemes than were engaged in any form of environmental reporting. Table 3.2 shows the break down (separately) by sector and by firm size. There is a strong suggestion that size plays a significant influence on an enterprise's decision to make some form of environmental report. However, the decision to embark upon environmental management schemes is far less well correlated with size, although size continues to play an important role.

The sectoral breakdown should be seen in the context of the fact that certain sectors are dominated by certain size bands. In particular, the farmers (of both aquatic and land based foodstuffs) are typically units with few employees (they are often sole traders). Thus, to the extent that size appears to be an important determinant of whether enterprises put together environmental reports, and to a lesser extent, their membership of EMS, their performance in these regards is poorer than that of larger organisations. One farmer reported membership of the Soil Association in response to questioning.

Table 3.2 : Environmental Management Schemes And Environmental Reporting By Size Band (Number Of Companies) And Sector

Size Band	Total	With EMS	%	With Env Report	%	With Both	%
1	13	2	15.4%	0	0.0%	0	0.0%
2	35	2	5.7%	1	2.9%	0	0.0%
3	4	1	25.0%	1	25.0%	0	0.0%
4	7	2	28.6%	2	28.6%	1	14.3%
5	10	6	60.0%	3	30.0%	2	20.0%
6	25	10	40.0%	8	32.0%	5	20.0%
7	14	10	71.4%	8	57.1%	7	50.0%
8	7	6	85.7%	5	71.4%	4	57.1%
9	3	2	66.7%	3	100.0%	2	66.7%
TOTAL	118	41	34.7%	31	26.3%	21	17.8%
Sector	Total	With EMS	%	With Env Report	%	With Both	%
Power Generation	4	4	100.0%	4	100.0%	4	100.0%
Chemicals	17	11	64.7%	12	70.6%	8	47.1%
Textiles	11	7	63.6%	0	0.0%	0	0.0%
Pulp and Paper	13	6	46.2%	6	46.2%	4	30.8%
Food and Drink	18	7	38.9%	5	27.8%	4	22.2%
Fish or Cress Farming	18	0	0.0%	0	0.0%	0	0.0%
Agriculture	27	5	18.5%	3	11.1%	1	3.7%
Recreation	6	0	0.0%	1	16.7%	0	0.0%
Other	4	1	25.0%	0	0.0%	0	0.0%
TOTAL	118	41	34.7%	31	26.3%	21	17.8%

These observations are entirely consistent with the view that only enterprises which are larger will be able to afford any form of environmental reporting, or will see it as important to their business. This may be linked to the perceived increase in reputational utility that may arise from reporting, or similarly, to companies in the spotlight (because of their environmental record, which itself might be linked to the scale of their operations) seeking to remove themselves from that spotlight. On the other hand, environmental management schemes may bring benefits irrespective of company size, whether because of cost savings or due to opportunities to increase profits by marketing environment-friendly (or organic) products. The significance of this last issue lies in the fact that some companies reporting 'other' EMS were operating their own schemes. This may be because of the costs of joining formal approved schemes.

3.3 Division of Management Responsibilities

We asked companies about the way in which they managed licences internally. We took the view that potentially, the division of responsibilities between different parties could affect the way in which firms react to abstraction charges. One hypothesis would be that if one person in a company has responsibility for making changes to licences, for ensuring compliance, and for the financial side of consents, decision making is likely to be more consistent with the realities facing the company. The responsiveness to changes in charging might be greater under these conditions.

Similarly, enterprises in which the budget for licences is set specifically, and is not diluted by wider financial concerns within the enterprise, may be more likely to respond to changes in abstraction licence costs. In this situation, a change in costs which may be small in terms of the enterprise's overall financial position could be quite considerable in terms of the budget allocated specifically for licences (or if budgets are set within a small group of expenditure items).

These hypotheses are not, of course, testable in the current study. To test them would require one to assess the changes that occurred in the wake of an increase in abstraction licence costs.¹ However, we have sought to shed some light on the different ways in which different enterprises approach the management, financial and otherwise, of their licences.

3.3.1 Application for, and Renewal of, Licences

The first area of competence examined was that of the application for, renewal of, and revision of licences. Responsibilities in this regard fell principally with senior management / company (typically farm) owners. In more than 75% of cases, the person responsible was from a senior management function (see Figure 3.5). 3 respondents did not know who held this responsibility. We are not of the view, however, that this necessarily constitutes a significant observation since there may have been no reason to consider such changes / revisions. The intermediaries mentioned were land agents and the National Farmers' Union.

By management function, this was shown to be a responsibility typically held by those from general management (see Figure 3.6). Only 12 percent of respondents reported that this was undertaken by someone from an environmental management function. It is perhaps to be expected that decisions to apply or revise licences would be taken by senior management personnel since these decisions are of a strategic nature for the business concerned.

¹ *If this were to occur, this study could provide a baseline for such an analysis.*
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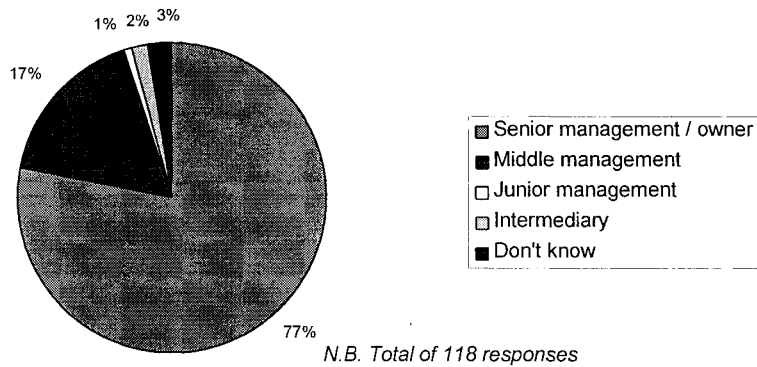


Figure 3.5 : Responsibility For Obtaining / Revising Licences By Management Seniority

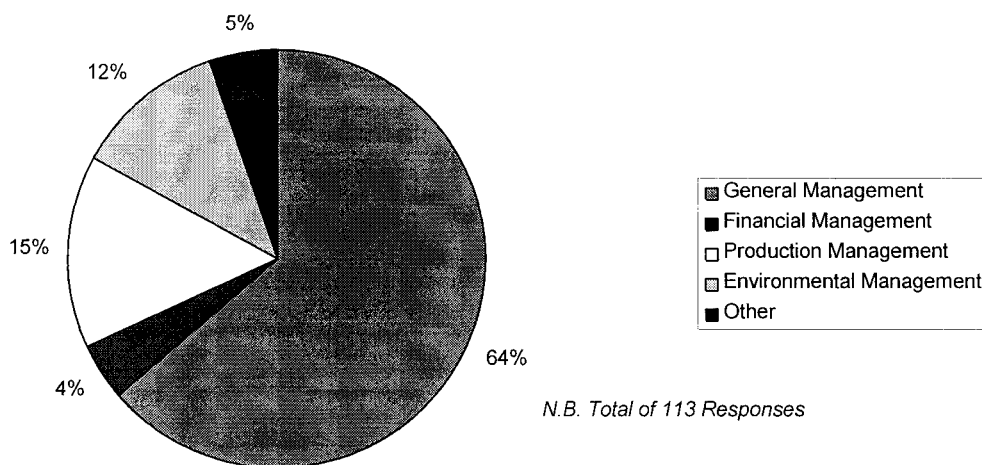


Figure 3.6 : Responsibility For Obtaining / Revising Licences By Management Function

3.3.2 Compliance With Terms of Licence

Responsibility for compliance with the terms of the licence follows a similar pattern to the responsibility for acquiring for and renewing licences (see Figure 3.7 and Figure 3.8). However, our sense was that this was an area where responsibility as such was not clearly defined. This comment is made more on the basis of the vagueness of some of the replies than on hard statistical evidence, but it is consistent with the view that compliance is regarded as something that just happens in the day to day running of the business. The figures dividing responses by management seniority and management function are shown below.

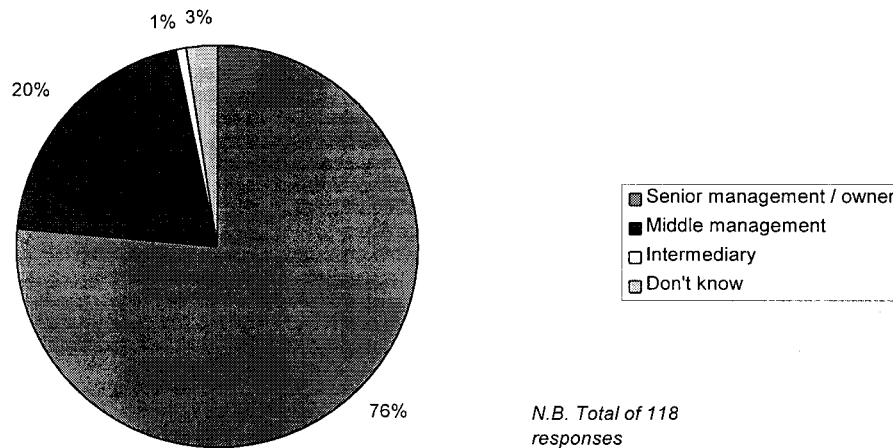


Figure 3.7 : Responsibility For Ensuring Compliance By Management Seniority

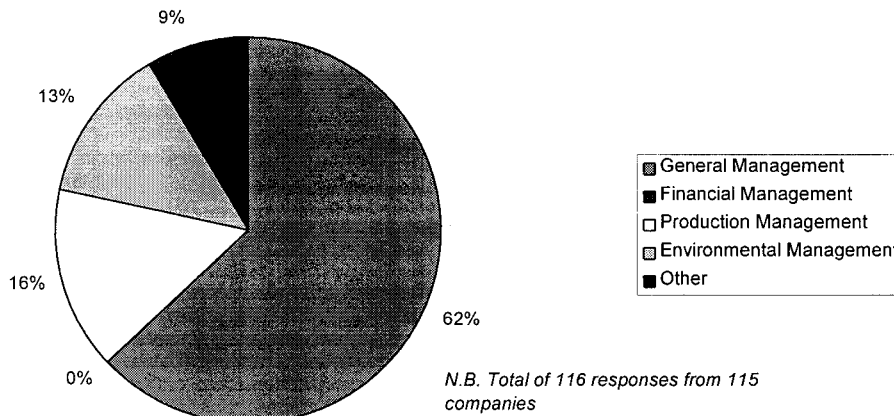


Figure 3.8 : Responsibility For Ensuring Compliance By Management Function

Respondents were asked whether there were incentive schemes in place which encouraged staff to ensure compliance. 111 of the 118 respondents said that no such scheme existed, and one was unable to comment. The two part tariff, and the threat of prosecution were mentioned by respondents, as was 'financial pressure'. However, in only six responses were there schemes that appear to have been designed to incentivise staff to ensure compliance, and these are shown in Table 3.3. With the exception of the pulp and paper company, these are large companies with over 500 employees and turnover in excess of £50 million.

Table 3.3 : Incentive Schemes To Ensure Compliance With Terms Of Abstraction Licence

Scheme	Sector	Employee Size Band	Turnover Size Band
Bonus scheme related to env performance.	Chemicals	8	8
Bonus scheme	Pulp and Paper	6	6
Profit related(managers only)	Food and Drink	8	7
Personal budget rests on reducing utility use by 3% pa	Food and Drink	9	7
Targets related to salary. Some staff have specific responsibilities related to profit related pay	Power Generation	8	7
Performance management schemes	Chemicals	8	7

3.3.3 Responsibility for Financial Management of Licences

Financial responsibility for consents shows a slightly different pattern of responsibility to that for the other two areas (see Figures 3.9 and 3.10). The most notable fact is that there is greater involvement of financial management at the expense of environmental and general managers. Even so, the representation of financial management in the responsibility for the financial side of abstraction licences is still quite low (12%). In addition, the respondents knew less about the people involved in the financial side of things (there was a higher percentage of responses in the 'don't know' category).

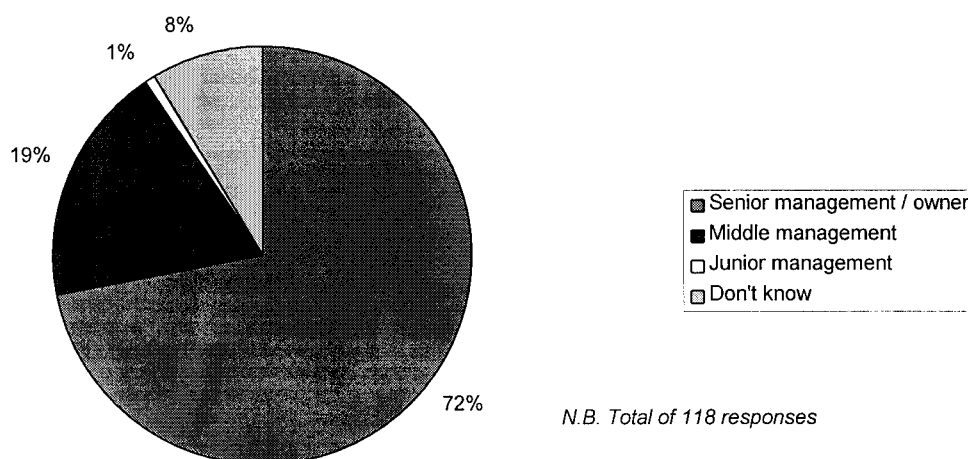


Figure 3.9 : Responsibility For Financial Management Of Licences By Management Seniority

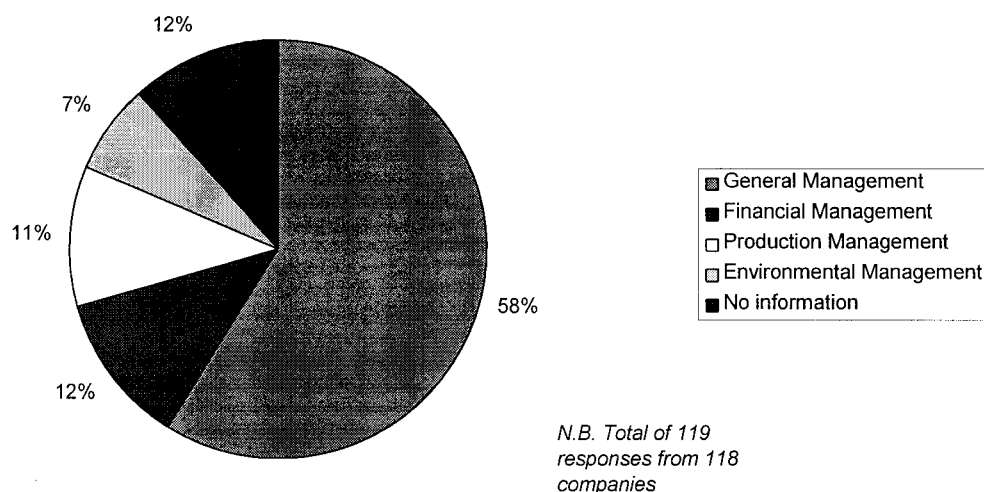


Figure 3.10 : Responsibility For Financial Management Of Licences By Management Function

3.3.4 Degree of Concentration of Tasks Related to Licence Management

The division of responsibilities amongst different people within an enterprise is shown, split by sector, in Table 3.4. This shows that for a large percentage of respondents, all responsibilities were held by one person.

Table 3.4 : Companies In Which All Responsibility For Licences Is Held By One Person (By Sector)

Sector	All Responsibility held by Same Person	Co's responding 1-4	Number as % of Total Responding
Power Generation	1	4	25%
Chemicals	8	15	53%
Textiles	7	11	64%
Pulp and Paper	7	13	54%
Food and Drink	14	17	82%
Fish Farming	16	18	89%
Agriculture	24	26	92%
Recreation	5	6	83%
Other	3	4	75%
TOTAL	85	114	75%

However, in our sample, this figure is biased by the fact that the farming sectors are essentially small owner-run businesses where one might expect the owner to hold all responsibility. In Table 3.5, one can see that if one ignores the very small firms, the responsibilities begin to appear more diffuse. Medium sized firms have the lowest incidence

of cases where management is concentrated with one person, whilst the largest firms have more.

Table 3.5 : Companies In Which All Responsibility For Licences Is Held By One Person (by company size)

Company Size	All Responsibility held by Same Person	Companies Responding 1-4	Number as % of Total Responding
Sole Person	11	13	85%
1-9	32	34	94%
10-19	4	4	100%
20-49	6	7	86%
50-99	6	10	60%
100-199	15	24	63%
200-499	4	12	33%
500-999	5	7	71%
1000-1999	2	3	67%
2000+	0	0	0%
total	85	114	75%

To the extent that having responsibilities concentrated in one person might ensure greater responsiveness to changes in the licence charging system, one might say that small companies are best placed, though of course, this is a matter of necessity as much as one of choice. Large companies appear to be well placed. They are likely to have responsibility concentrated in one person and they are also likely to have an environmental management system in place.

This hypothesis makes light of the possibilities for communication between parties where responsibility is not so concentrated. It is important to understand how the relevant parties communicate, and how budgets are set within the enterprise.

3.3.5 Communication in Cases of Diffuse Responsibility

In cases where management responsibilities were diffuse, the respondents were asked about the nature of communication between the individuals involved. 33 responses were obtained and these are presented in Table 3.6.

This suggests that in about half of the companies where no specific employee is charged with all aspects of licencing, there is no formal management procedure for communicating information concerning the various aspects of management associated with abstraction licences.

Table 3.6 : Responses From Enterprises Where Responsibility Is Diffuse

Response (nature of communication)	Number Giving Response		
Informal Management procedure	12		
Don't Know	16		
Other	2		
	3		
	<i>of which:</i>	<i>Company</i>	<i>Response</i>
		textile company with £10000000 turnover	depends on seriousness of problem
		Chemical company with £35000000 turnover	no need because abstraction is not contentious issue
		Farm with turnover between £1 and £5 mn	don't bother

3.3.6 Reporting to Senior Management

It is perhaps unsurprising, given the seniority of management involved in each of these areas of responsibility, that the costs of abstraction licences are reported to senior management level in the majority of the enterprises surveyed. 105 (89%) enterprises did so, 12 (10%) did not, and one enterprise did not know whether they did or not.

3.4 Setting Budgets For, and Reviewing the Costs of Licences

3.4.1 Reviewing Licence Costs

The surveyed enterprises were asked whether they reviewed the costs of abstraction licences, and if so, how frequently. This data is presented in Table 3.7.

The fact that so few companies do undertake a review (64% do not) suggests that the cost of water is not perceived as particularly high. This issue is explored in more detail below. We have provided a breakdown by sector and by company size (turnover) of those who do and do not review the costs of licences in Figures 3.11 and 3.12 below.

Table 3.7 : Number Reviewing Costs And Frequency Of Review

<i>Enterprise's Approach</i>	<i>Number %</i>	
Review costs	39	33
<i>Of which</i>		
<i>Weekly</i>	0	0
<i>Monthly</i>	4	3
<i>Quarterly</i>	1	1
<i>Six monthly</i>	4	3
<i>Annually</i>	25	22
<i>Other</i>	5	4
Don't Review Costs	76	64
Don't Know	3	3
TOTAL	118	100

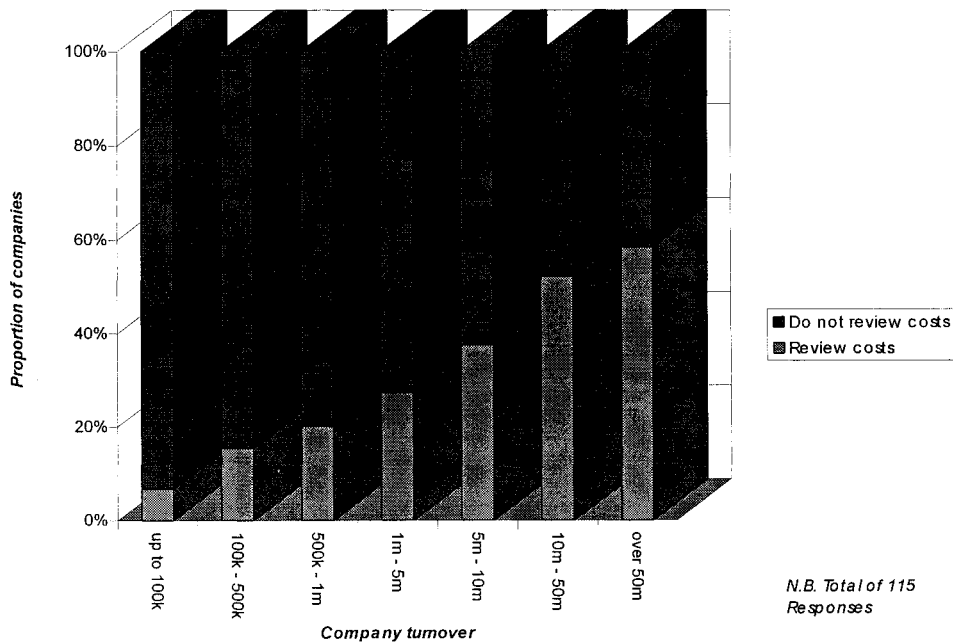


Figure 3.11 : Whether Companies Do Or Do Not Review Licence Costs (by turnover)

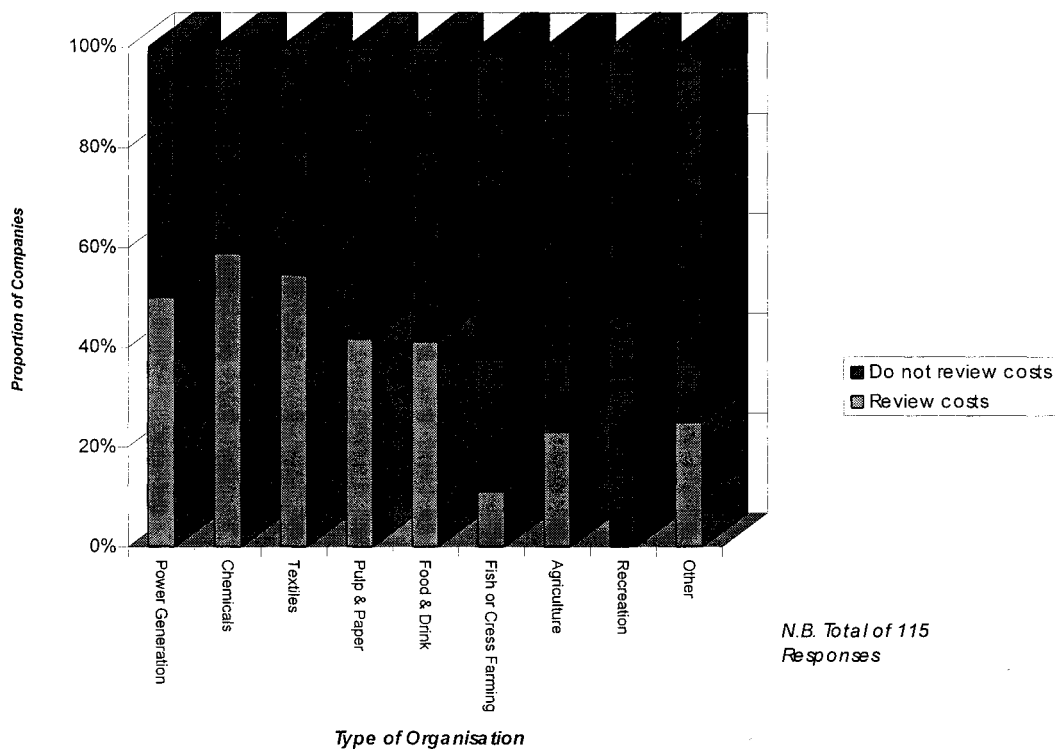


Figure 3.12 : Whether Companies Do Or Do Not Review Licence Costs (by sector)

The above figures suggest that those companies with a higher turnover are more likely to review their costs than those with lower turnover. Indeed, the correlation is quite striking. Larger companies are more likely to review abstraction costs than their smaller counterparts.

By sector, the best performer is the chemicals sector. However, even in this sector, the number of companies reviewing the costs of abstraction is less than 60%. A number of possible reasons suggest themselves. In the first instance, and this impression is supported by the contextual knowledge derived through the interview process, a number of enterprises may simply regard the abstraction licence as a fixed cost. With hindsight, we might have asked respondents whether they were aware of the potential to alter the costs of their licence (by reducing volumes abstracted).

The other possible explanation, and this is supported by evidence on asset values given below, would be that the value of holding a licence, and for holding a licence for as large a volume as possible, is deemed worth the costs irrespective of any (small) changes in licence charge. Of course, we are not in a position to judge what might happen if licence costs increased significantly, or if an incentive-based charging system were introduced. Our experience with the Landfill Tax suggests that significant changes in costs may provoke a reappraisal of costs, yet the fact that licences do have value as an asset suggests that (depending on the nature of the instrument) increasing licence costs might not have the same incentive effect in the case we are considering.²

² Unless, of course, a sort of two-part tariff system, such as that used to bill spray irrigators, were introduced on a wider scale.

3.4.2 Frequency of Review of Costs

The fact that most companies who do review costs do so annually is in keeping with what one would expect. Unless enterprise's have reason to believe that their water use will fluctuate wildly from one year to the next, one would expect most of those undertaking any sort of review to conduct such reviews annually (at the time at which any changes in the Agency's Standard Unit Charge is announced).

We asked enterprises whether they had experienced marked increases in the cost of their licences, and to comment on when, and for what reason, this had occurred. Figure 3.13 records their response to whether they had experienced such an increase or not.

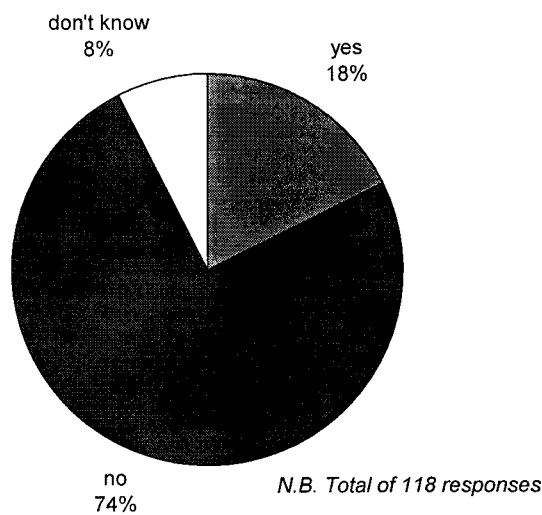


Figure 3.13 : Percentage Of Companies That Have Experienced Increases In Licence Costs

The 74% responding “no” are interesting since typically annual changes are made to the Standard Unit Charge. It suggests that few enterprises track these costs closely, and supports the observation that 64% of enterprises were not tracking licence costs. Responses were obtained regarding the year in which costs changed. The sixteen responses obtained are charted in Figure 3.14.

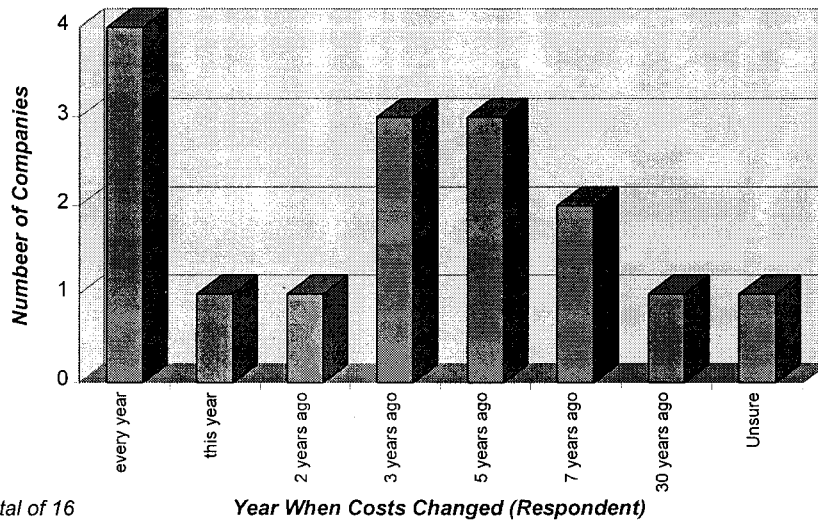


Figure 3.14 : Year In Which Respondents Replied That They Had Experienced Increased Charges

3.4.3 Effect of Investment Cycles on Cost Reviews

One might also expect some examinations of costs to occur as and when any new (or indeed old) water-saving technologies were brought to the attention of those responsible for such reviews. At that time, one would expect some form of cost benefit analysis / investment appraisal to take place. Indeed, one might reasonably expect there to be a close appraisal of costs and benefits at times when capital equipment was being replaced / maintained / updated. We did ask enterprises who mentioned that they did review costs whether there was any review of costs coincident with the timing of investment cycles. Of the 39 enterprises concerned, only 12 said that this was the case, while 24 said it did not. Three companies did not know.

3.4.4 Setting Budgets for Abstraction Licences

Budgets for abstraction can be set in different ways. At one extreme, they could be set independently of other budgets, whilst at the other, they could simply be treated as part of overall expenditure of the enterprise. As can be seen from Figure 3.15 below, most companies (59% of the sample) treat the costs of abstraction as part of overall expenditure.

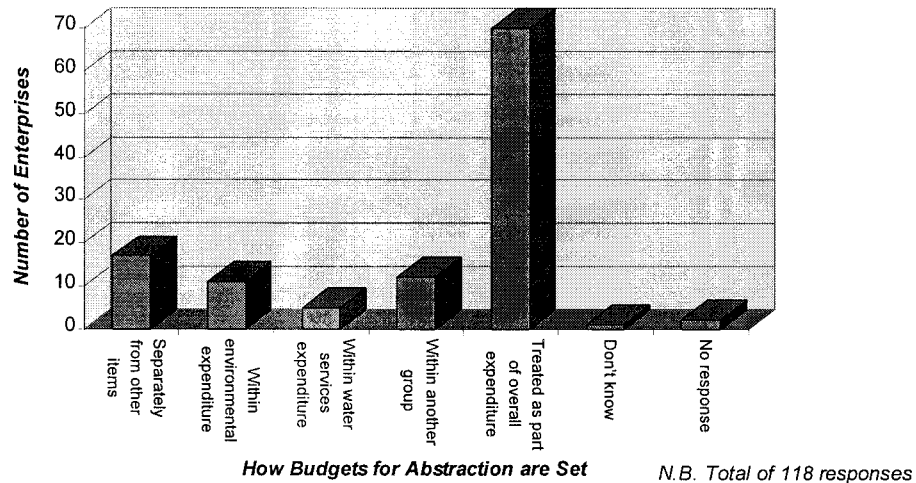


Figure 3.15 : Ways In Which Budgets For Abstraction Are Set

This raises questions concerning the pressures under which that expenditure may fall, since as will be seen below, the costs of abstraction licences are relatively small in terms of the turnover of the enterprise, so unless increases in costs are large, they are unlikely to have a major impact on company performance. One could postulate that the pressure to reduce expenditure on abstraction licences in this situation may vary according to how the Board of Directors perceives (or understands) the value of water abstraction, and of abstraction licences in particular, to the enterprise. Where the asset value, and the strategic value of holding licences is not recognised, pressure to cut costs may come from Directors who perceive licence charges to be like any other cost which they are seeking to reduce. A Director/owner who understands these values better might be expected to treat licence costs as a special case under the current charging system.

It should be pointed out that the number treating licence costs as part of their general budget was, as expected, large in the farming sectors. It is not the case, however, and Table 3.8 confirms this, that these are the only sectors represented. Pulp and Paper and Textiles are both strongly represented in the sample.

3.4.5 Comment

The majority of companies in our survey do not review the costs of their abstraction licences. Larger companies are more likely to do so and there is sectoral variation which reflects this. In the key non-farming sectors, only 40 to 60% of companies review their costs. To some extent, this is confirmed by data on experience of changes to licence costs.

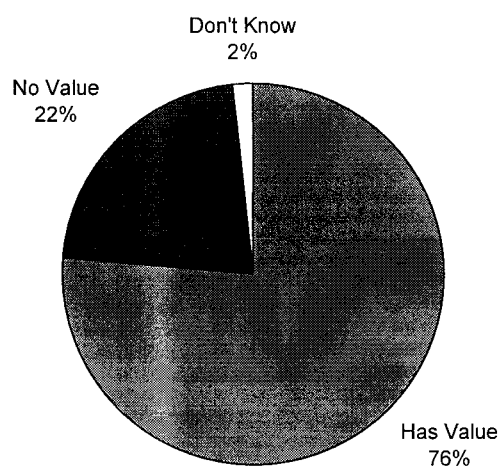
Table 3.8 : Sectoral Breakdown Of Companies Treating Licences As Part Of General Expenditure.

Sector	Number Treating Licences as Part of General Budget	Number in Sample	% of Total Number in Sample
Power Generation	0	4	0%
Chemicals	4	17	24%
Textiles	7	11	64%
Pulp & Paper	9	13	69%
Food & Drink	6	18	33%
Fish or Cress Farming	15	18	83%
Agriculture	21	27	78%
Recreation	6	6	100%
Other	2	4	50%

It is also the case that most companies (59% of the sample) simply treat their licences as part of their total expenditure. Whilst the farming sectors are strongly represented in this group, significant proportions of other sectors are included.

3.5 Asset Value of Licences

Enterprises may perceive abstraction licences as an asset since they secure rights to a resource which appears to be becoming increasingly scarce, particularly in some regions. We asked those interviewed to comment on whether they felt that licences had such a value. The responses are shown in Figure 3.16.



N.B. Total of 118 respondents

Figure 3.16 : Companies Perceptions Regarding The Asset Value Of Licences

Various reasons were given to explain the asset value. These were quite varied though by no means unexpected. We coded the reasons given for the underlying asset value following completion of the survey. These are shown in Figure 3.17.

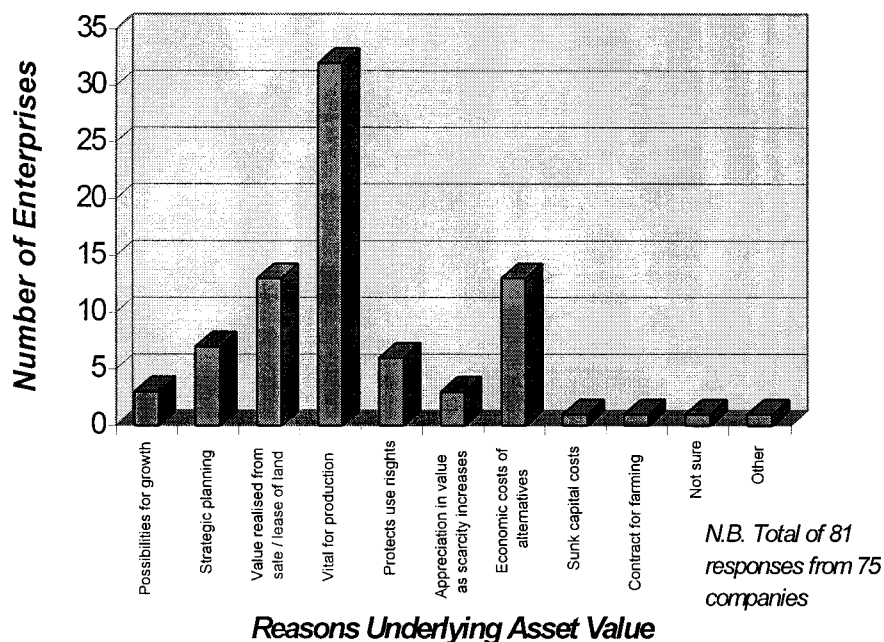


Figure 3.17 : Reasons For Underlying Asset Value Of Licences

The main reason given was that licences were vital for production. Also important, and probably related (except in cases where no viable alternative is available), was the view that having a licence was important since it did not necessitate use of alternative water sources, which were more expensive.

An important quality of licences is that when land is sold, the new land owner can succeed to the licence. This value was recognised by a number of farmers, but also others. One company that had ceased trading was effectively leasing its licence through leasing its land to a third party. Another respondent was not using her licence but was paying for it because she was putting her property on the market. In the agricultural context, one farmer noted that it was essential to have a licence in order to conclude a contract with a large food processing company. It would appear, therefore, that even where enterprises consume much less than their total licenced volume, they will be prepared to pay the cost of the licence because of the asset value which the licence represents.

This will be especially true of cases where licences are not time limited, or where they have a long life. Knowledge concerning the terms of licences is shown in Figure 3.18 below. It is worthy of note that a fair percentage of the sample (28%) did not know the term of their licence.

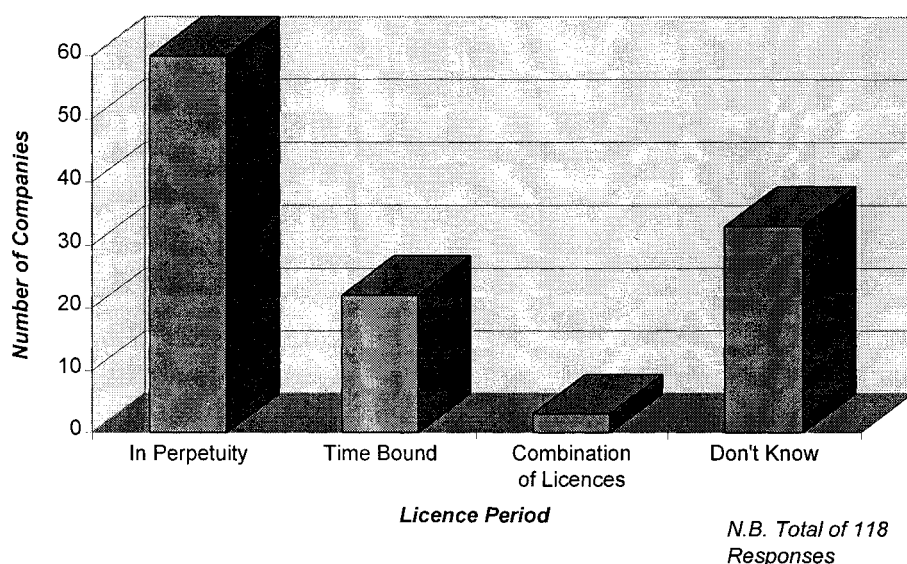


Figure 3.18 : Survey Sample Broken Down By Longevity Of Licences

To see how the form of licences affected the view as to whether the licence was an asset or not, the term of licences and the asset value are recorded together in Table 3.9.

Table 3.9 : Length Of Term Of Licences Held By Those Perceiving A Positive Asset Value

Length of Term	Number	Number as % Total With Positive Asset Value	Number as % of Total With This Length of Licence
Perpetuity	47	52	78
Time Bound	19	21	86
Combination of Licences	2	2	67
Don't Know	22	24	67
TOTAL	90	100	76

The results seem counterintuitive in that a higher percentage of enterprises with time bound licences than those with licences in perpetuity perceive that their licence has an asset value. Two-thirds of those who did not know the term of their licence still felt able to comment that their licence had value as an asset.

3.6 Perception of Charge Level

The most complex area of this study is the analysis of perception of abstraction licence costs among respondents. We asked enterprises directly the question of how they perceived licence costs. Were the costs high, fairly set, or low? The break down of responses is shown in Figure 3.19.

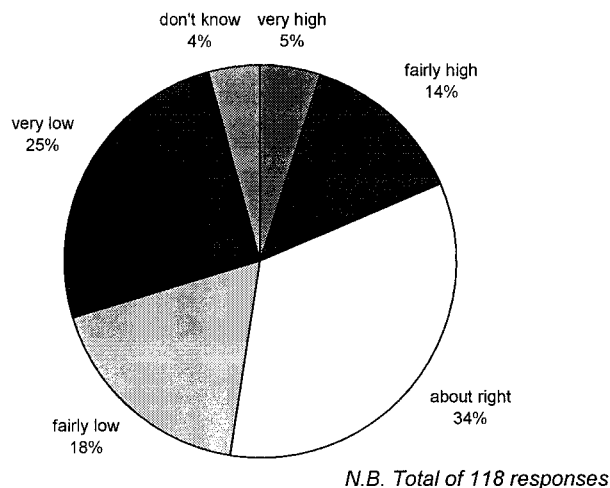


Figure 3.19 : Responses Concerning The Level Of Licence Charges

It is interesting to note that only 43 % of respondents thought the licence cost was low or very low. This seems small given the fact that licences are perceived as assets by a large percentage of respondents (as discussed above). Even so, only 19% thought the charges were high or fairly high. A third thought the charges were set at about the right level. There were interviews in which respondents felt obliged to express a private view independent of that of their company. Typically, the opinion expressed privately was that ‘water is too cheap’ and that the licence fee was too small (thereby possibly confusing the level of payment with its purpose - see below).

On the other hand, it may be that enterprises, aware of the client for whom the work was being undertaken, were concerned not to convey an impression that licence charges should be increased.³ We looked at the responses split by those who believed their licence to have an asset value, and those that did not (see Table 3.10). It will be seen that only where respondents saw the costs as very high is there any reason to believe that the perception of licences as an asset (or not) plays a role in shaping opinions concerning the charge level.

³ It is notable that the Environment Agency seemed to be perceived very much as the enforcer-type regulator rather than a more even-handed regulator / advisor. This is an impression, and not supportable by hard evidence.

Table 3.10 : Perception Of Charge Level Split By Perception Of Asset Value / No Asset Value

Perception	Asset value	No asset value	% with view on perception who think licence has an asset value
Very high	3	3	50%
Fairly high	13	3	81%
About right	31	8	79%
Fairly low	16	4	80%
Very low	24	6	80%
Don't know	3	2	60%

The responses broken down by sector, by Agency region and by size categories are given below in Table 3.11. The farming sectors are those for whom abstraction costs are deemed very high. Three of these are located in a high charge region, Anglia, but two are located in the North east (Yorkshire) region with the lowest SUC in the country. These sectors are similarly well represented in the 'fairly high' category, although three out of the four power generation companies are to be found in this category (the highest percentage of any sector in the 'very high' and 'fairly high' bands).

The data is displayed graphically, for ease of representation, in Figures 3.20, 3.21 and 3.22. This confirms the fact that the farming sectors feel that the charges are high, whilst power generators also believe the charges to be fairly high. There is no obvious relationship by sizeband or region, though in Wales, there are a large number of don't knows, and the views on the charge appear to be skewed towards the lower end relative to the other regions. Wales does have a low SUC.

Figure 3.20 : Perception Of Charge By Sector

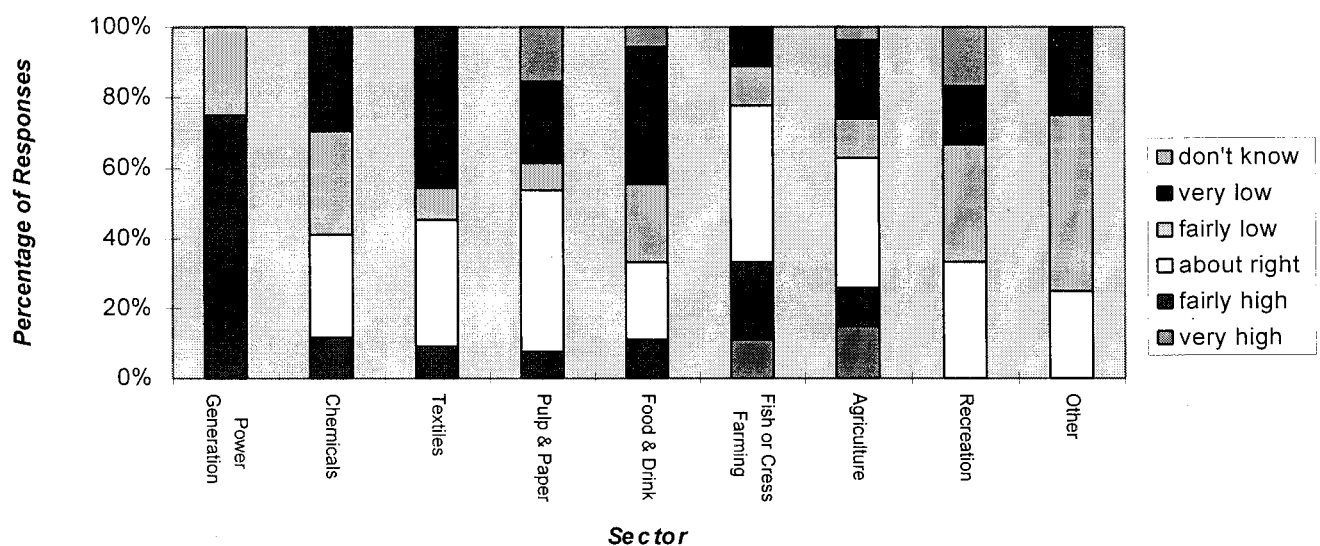


Table 3.11 : Perception Of Charge Level Split By Sector, Region, And Sizeband

<i>By Sector</i>	Very high	Fairly high	About right	Fairly low	Very low	Don't know	TOTAL
Power Generation		3		1			4
Chemicals		2	5	5	5		17
Textiles		1	4	1	5		11
Pulp and Paper		1	6	1	3	2	13
Food and Drink		2	4	4	7	1	18
Fish or Cress Farming	2	4	8	2	2		18
Agriculture	4	3	10	3	6	1	27
Recreation			2	2	1	1	6
Other			1	2	1		4
TOTAL	6	16	40	21	30	5	118
<i>By Agency Region</i>							
1	3	4	6	5	7	1	26
2	1	1	10	5	5	3	25
3			1				1
4		5	11	3	5		24
5	2	6	11	7	12	1	39
6							0
7							0
8				1	1		2
TOTAL	6	16	40	21	30	5	118
<i>By Sizeband (turnover)</i>							
1	1	2	6	4	2		15

2	2	1	6	2	2	13
3		1	2	1	1	5
4		2	5	2	1	12
5		1	1	2	4	8
6		1	10	2	9	23
7		4	2	3	3	12
8		2	4	4	4	17
9	3	2	4	1	3	13
TOTAL	6	16	40	21	30	118

By (employees)	Sizeband					
1		2	5	3	1	13
2	4	5	12	6	7	35
3			2		2	4
4		1	2	3	1	7
5		4	3	1	5	13
6		2	11	2	8	25
7		2	4	4	3	14
8			1	1	3	6
9				1	1	1
TOTAL	6	16	40	21	30	118

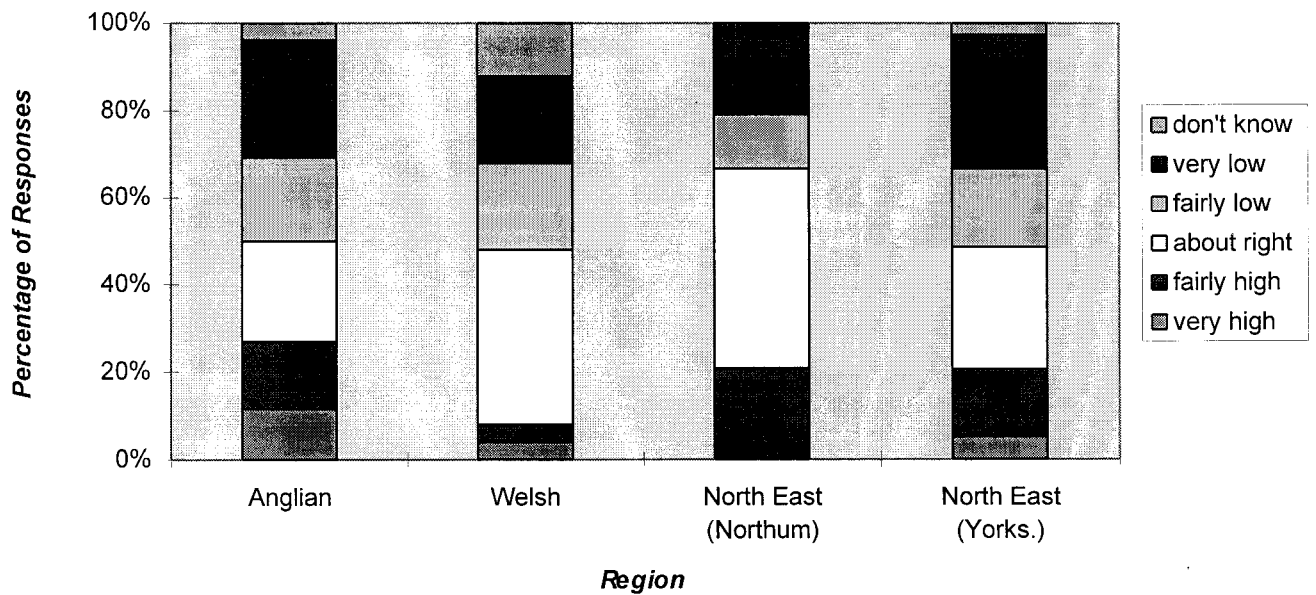


Figure 3.21 : Perception Of Charge By Region

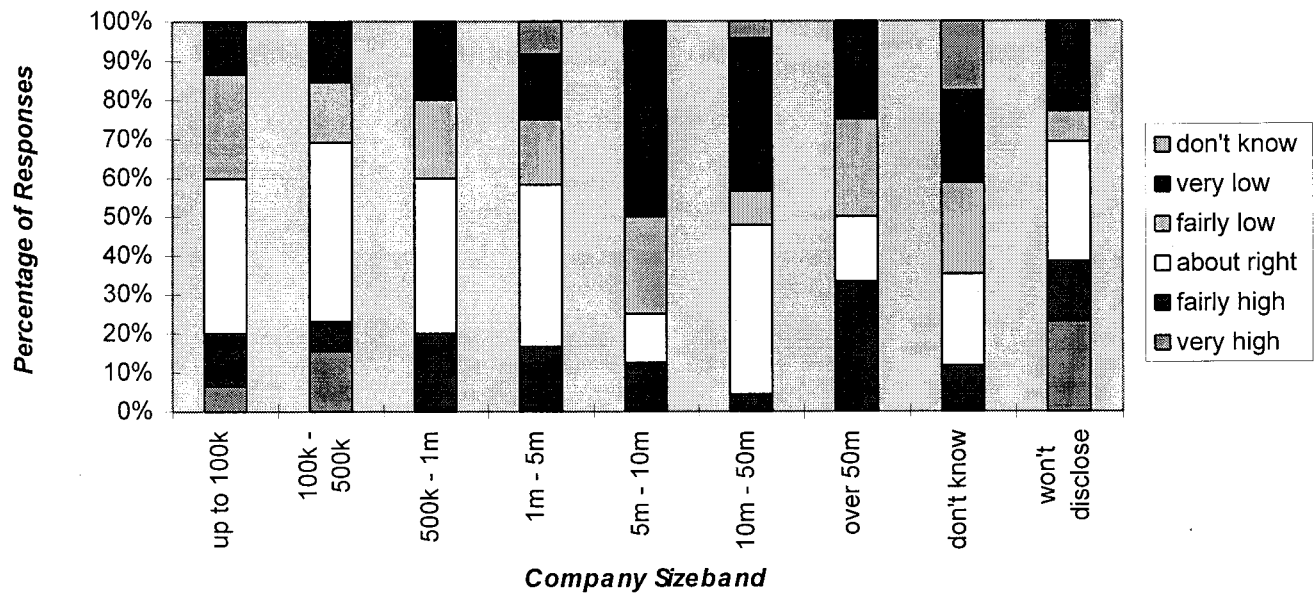


Figure 3.22 : Perception Of Charge By Turnover Sizeband

3.7 Awareness of Reasons for Paying

One reason for this may be that customers believe that they not receiving value for money for what they are paying for. When asked whether they were aware of the reasons for applying the charge, 95 companies said they were and 23 said they were not. The reasons they gave for this, however, were quite varied. These are given in Table 3.12 (the responses were coded following open-ended responses). Few of the responses were entirely accurate though many

show some idea of the rationale for the charging. Others, however, are less well informed. To the extent that companies may feel the charges are high or low, this may relate to what they perceive the charge to be for. For this reason, Table 3.12 contains a column noting the perceptions of the charge alongside the reasons given for paying the charge (where a “1” represents a view that the charge is high, a 5 represents the view that the charge is low, and a 6 indicates ‘don’t know’).

Table 3.12 : Breakdown Of Responses To Question Concerning Reason For Abstraction Licence Charge

Response	Number of Companies	
EA admin and monitoring	6	3,3,4,5,5,5,
EA admin cost recovery	12	1,2,2,3,3,3,3,4,5,5,5,6
EA costs	18	2,3,3,3,3,3,3,4,4,4,4,5,5,5,5,5,5
To keep EA running	1	4
Pay for rivers authority	2	3,5
Supervise / maintain rivers / watercourses	11	2,2,2,3,3,3,4,4,5,5,5
Regulation	1	3
Monitoring	7	3,3,4,4,5,5,6
Enforcement	4	1,3,3,4
Monitoring waste water	3	3,4,5
Secure rights	3	2,3,3
Pay for use / cost of water / resource	10	2,3,4,4,4,5,5,5,5,6
A form of tax	4	1,4,5,5
Water companies' pockets	1	5
Cost of downstream water diversion	1	3
Keep someone in a job	1	2
Because I have to	1	3
To clean rivers	1	4
No reply	14	1,2,2,3,3,3,3,3,3,3,5,5,5,5

N.B. Total of 100 responses from 95 companies

The Table produces some interesting anomalies. For example, the respondent who thought that the charge was going into water companies’ pockets, and three of four respondents who thought the charge was a form of tax were of the view that the charge was very low. However, along with the ‘no reply’ responses, those who had a good idea of the reasons for the charge were responsible for most of the responses in the ‘about right’ category concerning the level of the charge. Also worthy of note is the fact that five of the ten respondents who thought that the charge related to payment for use of the resource felt that the charge was fairly low or very low, with only one commenting that it was fairly high.

We did receive some responses where the interviewee expressed dissatisfaction with the level of the charge because they did not feel the monitoring that they understood themselves to be paying for was being carried out satisfactorily. It is important to emphasise also that there was a strong sense gained from the interviews undertaken that many felt that they had a right to use water without paying for use. The responses above do not, we believe, adequately convey the strength of that feeling among many respondents. Quite why that is the case is difficult to understand.

3.8 Knowledge of Costs and Size of Costs Relative to Turnover and Other Expenditure Items

83 companies (70% of the sample) were able to give a figure for the Agency annual charge. Whether the charge was known or not is split by sector and by company size in Tables 3.13 and 3.14

Table 3.13 : Knowledge Of Annual Charge By Sector

Sector	Number in Sample	Number who Know Annual Charge	% of Sample Knowin Annual Charge
Power Generation	4	2	50%
Chemicals	17	13	76%
Textiles	11	10	91%
Pulp and Paper	13	7	54%
Food and Drink	18	10	55%
Fish or Cress Farming	18	17	95%
Agriculture	27	17	63%
Recreation	6	4	67%
Other	4	3	75%
TOTAL	118	83	70%

Table 3.14 : Knowledge Of Annual Charge By Turnover Sizeband

Turnover Sizeband	Number in Sample	Number who Know Annual Charge	% of Sample Knowin Annual Charge
	15	14	93%
	13	10	77%
	5	2	40%
	12	5	42%
	8	6	75%
	23	16	43%
	12	9	75%
	17	12	71%
	13	9	69%

For those who were able to provide a charge figure, as well as a turnover figure, we calculated the charge as a percentage of turnover. Individual figures are given in Tables 3.15 and 3.16. These are ordered by sector, then by turnover size band, and by turnover respectively. Note that this is the figure for the financial charge paid to the Environment Agency only. We did ask respondents about the other costs associated with the charge, such as administrative costs, and the costs associated with ensuring compliance with the terms of the licence. Very few companies reported significant administrative costs. We have not reported that data here since the lack of responses in many cases means that the analysis is rather similar to what has already been done with the annual charge.

It will be appreciated that there is substantial variation in the Agency abstraction licence charge expressed as a percentage of company turnover. However, it would appear that the figure falls as turnover rises. Small enterprises generally pay more by this measure than others. Similarly, the sectoral split shows that the farming sectors fare less well by this measure than other sectors. The sectoral averages vary from 0.018% to 0.232%, a factor of more than 10. Across all companies, the magnitude of the measure varies from a maximum of 1.167% to a minimum of less than 0.000%, a factor of at least 2,000.

One might expect that the charge as a percentage of turnover would vary to some extent with the Agency region given the variation in SUC. The same data as presented above is shown in Table 3.17, sorted by SUC region. Perhaps the most surprising feature of this Table is that those regions with the highest average figure are those with the lowest SUCs. this, however, is due to the effect of certain industries being more heavily represented in some regions' average charge calculation than in others (a weighting effect by sector).

Table 3.15 : Abstraction Charges Paid To The Environment Agency Expressed As A Percentage Of Turnover (sorted by sector and turnover sizeband)

Sector	Turnover Sizeband	Turnover (£)	EA charge	EA Charge as % Turnover	Sectoral Averages
3	7	£290,000,000	£152,000	0.052%	0.031%
3	7	£750,000,000	£74,500	0.010%	
4	6	£15,000,000	£1,100	0.007%	0.040%
4	6	£19,000,000	£42,912	0.226%	
4	6	£23,500,000	£6,500	0.028%	
4	6	£30,000,000	£90	0.000%	
4	6	£40,000,000	£850	0.002%	
4	7	£80,000,000	£10,000	0.013%	
4	7	£123,000,000	£7,000	0.006%	
5	3	£785,000	£105	0.013%	0.046%
5	4	£3,500,000	£760	0.022%	
5	4	£4,000,000	£3,000	0.075%	
5	5	£6,500,000	£10,000	0.154%	
5	5	£8,000,000	£26	0.000%	
5	6	£10,000,000	£5,000	0.050%	
5	6	£30,000,000	£2,211	0.007%	
6	6	£20,000,000	£40,000	0.200%	0.094%
6	6	£23,000,000	£9,868	0.043%	
6	7	£100,000,000	£38,902	0.039%	
7	1	£60,000	£30	0.050%	0.018%
7	5	£8,500,000	£1,000	0.012%	
7	6	£15,000,000	£3,000	0.020%	
7	6	£30,000,000	£1,933	0.006%	
7	7	£60,000,000	£10,000	0.017%	
7	7	£150,000,000	£291	0.000%	
8	1	£10,000	£25	0.250%	0.232%
8	1	£20,000	£25	0.125%	
8	1	£50,000	£25	0.050%	
8	1	£60,000	£700	1.167%	
8	1	£78,000	£204	0.262%	
8	1	£95,000	£100	0.105%	
8	2	£140,000	£25	0.018%	
8	2	£150,000	£400	0.267%	
8	2	£160,000	£25	0.016%	
8	2	£160,000	£500	0.313%	
8	2	£250,000	£324	0.130%	
8	2	£300,000	£250	0.083%	
9	1	£15,000	£88	0.587%	
9	1	£60,000	£200	0.333%	
9	2	£138,000	£75	0.054%	
9	3	£900,000	£477	0.053%	
9	4	£1,000,000	£2,000	0.200%	
9	4	£1,500,000	£560	0.037%	
9	4	£3,000,000	£32	0.001%	
9	5	£10,000,000	£2,400	0.024%	
10	2	£400,000	£25	0.006%	0.005%
10	5	£5,000,000	£150	0.003%	
11	2	£250,000	£150	0.060%	0.031%
11	6	£12,443,200	£200	0.002%	

Table 3.16 : Abstraction Charges Paid To The Environment Agency Expressed As A Percentage Of Turnover (sorted by turnover)

Turnover Sizeband	Sector	Turnover (in £)	EA Charge	EA Charge as % Turnover	Average Figure for Turnover Sizeband
1	8	£10,000	£25	0.250%	0.325%
1	9	£15,000	£88	0.587%	
1	8	£20,000	£25	0.125%	
1	8	£50,000	£25	0.050%	
1	7	£60,000	£30	0.050%	
1	9	£60,000	£200	0.333%	
1	8	£60,000	£700	1.167%	
1	8	£78,000	£204	0.262%	
1	8	£95,000	£100	0.105%	
2	9	£138,000	£75	0.054%	0.105%
2	8	£140,000	£25	0.018%	
2	8	£150,000	£400	0.267%	
2	8	£160,000	£25	0.016%	
2	8	£160,000	£500	0.313%	
2	11	£250,000	£150	0.060%	
2	8	£250,000	£324	0.130%	
2	8	£300,000	£250	0.083%	
2	10	£400,000	£25	0.006%	
3	5	£785,000	£105	0.013%	0.033%
3	9	£900,000	£477	0.053%	
4	9	£1,000,000	£2,000	0.200%	0.067%
4	9	£1,500,000	£560	0.037%	
4	9	£3,000,000	£32	0.001%	
4	5	£3,500,000	£760	0.022%	
4	5	£4,000,000	£3,000	0.075%	
5	10	£5,000,000	£150	0.003%	0.039%
5	5	£6,500,000	£10,000	0.154%	
5	5	£8,000,000	£26	0.000%	
5	7	£8,500,000	£1,000	0.012%	
5	9	£10,000,000	£2,400	0.024%	
6	5	£10,000,000	£5,000	0.050%	0.049%
6	11	£12,443,200	£200	0.002%	
6	4	£15,000,000	£1,100	0.007%	
6	7	£15,000,000	£3,000	0.020%	
6	4	£19,000,000	£42,912	0.226%	
6	6	£20,000,000	£40,000	0.200%	
6	6	£23,000,000	£9,868	0.043%	
6	4	£23,500,000	£6,500	0.028%	
6	4	£30,000,000	£90	0.000%	
6	7	£30,000,000	£1,933	0.006%	
6	5	£30,000,000	£2,211	0.007%	
6	4	£40,000,000	£850	0.002%	
7	7	£60,000,000	£10,000	0.017%	
7	4	£80,000,000	£10,000	0.013%	
7	6	£100,000,000	£38,902	0.039%	
7	4	£123,000,000	£7,000	0.006%	
7	7	£150,000,000	£291	0.000%	
7	3	£290,000,000	£152,000	0.052%	
7	3	£750,000,000	£74,500	0.010%	

Table 3.17 : Abstraction Charges Paid To The Environment Agency Expressed As A Percentage Of Turnover (Sorted By Agency Region)

Region	Turnover	Agency Annual Charge	Annual Charge as % Turnover	Regional Average	Regional Average Turnover
1	£123,000,000	£7,000	0.006%	0.065%	£38,183,867
1	£23,500,000	£6,500	0.028%		
1	£60,000,000	£10,000	0.017%		
1	£160,000	£500	0.313%		
1	£10,000,000	£2,400	0.024%		
1	£12,443,200	£200	0.002%		
2	£15,000,000	£1,100	0.007%	0.125%	£11,688,733
2	£19,000,000	£42,912	0.226%		
2	£100,000,000	£38,902	0.039%		
2	£20,000,000	£40,000	0.200%		
2	£15,000,000	£3,000	0.020%		
2	£60,000	£30	0.050%		
2	£140,000	£25	0.018%		
2	£50,000	£25	0.050%		
2	£300,000	£250	0.083%		
2	£78,000	£204	0.262%		
2	£150,000	£400	0.267%		
2	£138,000	£75	0.054%		
2	£15,000	£88	0.587%		
2	£5,000,000	£150	0.003%		
2	£400,000	£25	0.006%		
4	£290,000,000	£152,000	0.052%	0.070%	£51,192,500
4	£30,000,000	£90	0.000%		
4	£150,000,000	£291	0.000%		
4	£30,000,000	£1,933	0.006%		
4	£8,500,000	£1,000	0.012%		
4	£95,000	£100	0.105%		
4	£20,000	£25	0.125%		
4	£3,000,000	£32	0.001%		
4	£60,000	£200	0.333%		
4	£250,000	£150	0.060%		
5	£750,000,000	£74,500	0.010%	0.125%	£53,314,722
5	£40,000,000	£850	0.002%		
5	£80,000,000	£10,000	0.013%		
5	£8,000,000	£26	0.000%		
5	£30,000,000	£2,211	0.007%		
5	£785,000	£105	0.013%		
5	£3,500,000	£760	0.022%		
5	£10,000,000	£5,000	0.050%		
5	£4,000,000	£3,000	0.075%		
5	£6,500,000	£10,000	0.154%		
5	£23,000,000	£9,868	0.043%		
5	£160,000	£25	0.016%		
5	£250,000	£324	0.130%		
5	£10,000	£25	0.250%		
5	£60,000	£700	1.167%		
5	£1,500,000	£560	0.037%		
5	£900,000	£477	0.053%		
5	£1,000,000	£2,000	0.200%		

As an alternative gauge of abstraction costs, respondents were asked whether they knew how their abstraction licence charge compared with the amount they spent on energy, and on waste disposal. The results of these inquiries are shown in Figures 3.23 and 3.24.

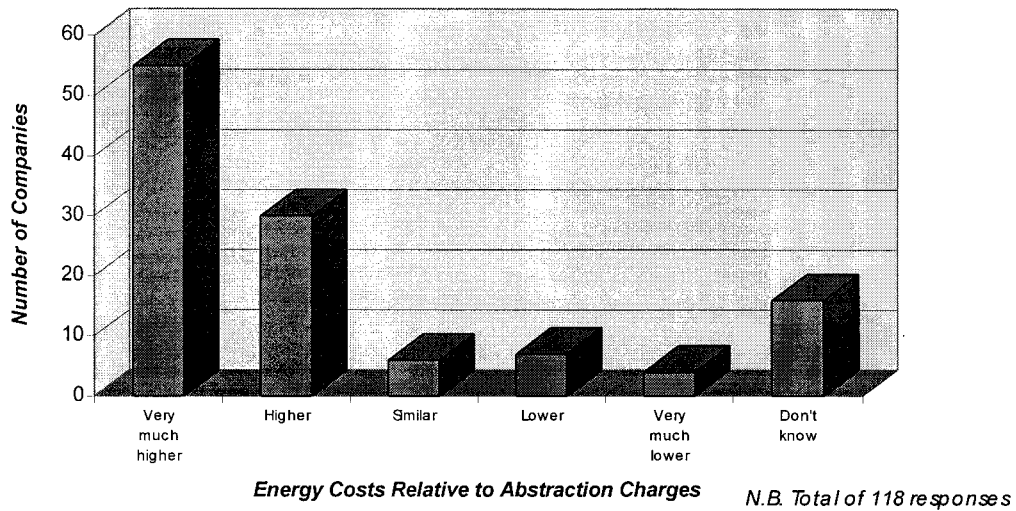


Figure 3.23 : Showing Costs Of Energy Relative To Abstraction Costs

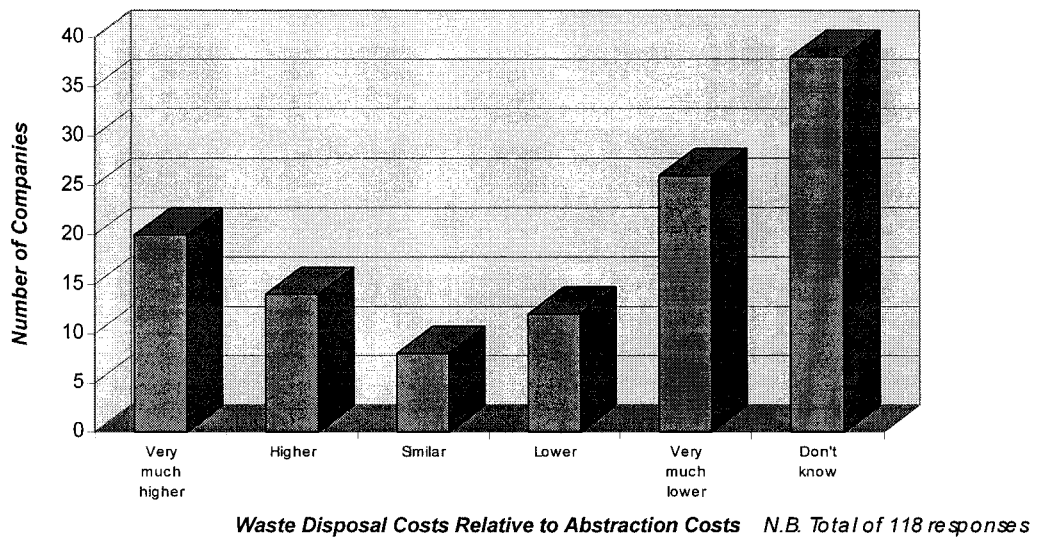


Figure 3.24 : Showing Costs Of Waste Disposal Relative To Abstraction Costs

The Figures show that in general, it was felt that energy costs were higher than abstraction costs amongst those able to comment. 47% of respondents said they were very much higher, whilst 25% said they were higher. 14% were unable to comment. For waste disposal, the responses were consistent with the view that waste disposal costs are generally lower than energy costs, and also, with the view that a greater number of companies know less about their waste disposal costs than about their energy costs. Fifteen of eighteen companies who replied that waste disposal costs were much lower claimed that waste disposal costs were zero, or close to it. On this evidence, it is difficult to say whether waste disposal costs are generally higher or lower than those for abstraction.

Some enterprises were able to quantify their relative costs. The data from those companies is shown in Table 3.18. They confirm the observations made above regarding energy. They also confirm that this information is not readily at the fingertips of what are often senior management personnel in the enterprises concerned. As regards waste disposal costs, they suggest that these are higher than abstraction costs when they are non-zero.

Table 3.18 : Agency Annual Charge Expressed As % Energy And Waste Disposal Costs

Number in Percentage Band	Agency Annual Charge as % Energy Costs	Agency Annual Charge as % Waste Disposal Costs	Waste Disposal Costs as % of Energy Costs
<=0.5%	11	4	2
<=1%	6	0	3
<=5%	9	2	2
<=10%	2	1	3
<=50%	2	5	2
>50%	2	3	3
>100%	0	4	1
TOTAL	32	19	16

3.9 Incentives for Changing level of Water Use

3.9.1 Size of Licences and Usage of Water

Licences varied in size quite considerably across the sample. We divided these into bands according to the discharge consent volume bands. They are shown in Table 3.19. Many of the figures given were quoted in gallons and have been converted.

Table 3.19 : Licences By Volume Band

Licence Sizes	Number of Enterprises
up to 2,000 m ³	7
2,000-7,300 m ³	10
7,300-40,000 m ³	19
40,000-400,000 m ³	34
400,000-4 million m ³	19
4-18 million m ³	14
18-55 million m ³	0
> 55 million m ³	1
Don't Know	34
TOTAL	138

N.B. Some companies have more than one licence. The Table does not include one power generating company with 13 licences.

One indicator of the pressure which companies might be under to reduce water use is how close they are to exceeding their licenced limit, always assuming that they perceive there to be a threat of being brought to book if they exceed that volume. We split companies into those

who used a given volume of water fairly consistently, and those whose use varied over time. A Table of consistent users, split by percentage of the licenced volume which they abstract, is given in Table 3.20.

Table 3.20 : Use As A Percentage Of Total Licenced Volume

Band by Use	Number of Enterprises
0-10%	15
11-20%	4
21-30%	2
31-40%	2
41-50%	6
51-60%	7
61-70%	8
71-80%	7
81-90%	4
91-100%	17
Don't Know	20
TOTAL	92

This Table shows that seventeen companies are clearly close to exceeding their licenced volumes. In fact, included within this seventeen are three companies who admit using in excess of 100% of their licenced volume. In addition, one company was operating without a licence for a borehole and one had been trying to obtain a licence from the Agency for some years. 2 enterprises had been threatened by the Agency with court action. Note that there is a significant number of companies (17% of the sample) reporting that they did not know what percentage of their licenced volume they were using.

One large food producing company (not included in the 118) has been abstracting on site for 30 years and was threatened with legal action by the Agency for unlicensed abstraction. 3½ years ago, they applied for one, but despite chasing this up, they still have no licence. They have also increased production and abstraction in the intervening period, so would now have to apply for an increase to their licence if they were awarded one. This would have been one of the largest companies in the survey (by turnover) and was a major abstractor.

These responses raise questions concerning the regulatory capacity of the Agency, and could be interpreted as implying that the current level of cost recovery charge is too low (other things being equal).

3.9.2 Consideration of Use of Alternative Water Sources

One way to overcome any constraints which licences might impose would be to consider the use of alternative sources of water. 42% of the sample have considered this, but only 5% actually do so (see Table 3.21). Of the 42% who have considered an alternative, 57% chose not to use any because of the expense. This was the main reason for not choosing to use an alternative water source.

Table 3.21 : Extent Of Enterprise's Consideration Of Alternatives

Enterprises' Consideration of Alternatives	Number	Percent
Have Not Considered Alternatives	68	58%
Never Occurred To Do So	9	8%
Happy With Current Arrangement	25	21%
No Alternative	31	26%
Other	13	11%
Have Considered, But Chose Not to Use, Alternatives	44	37%
Too Expensive	28	24%
Availability of Supply	6	5%
Quality of Supply Issues	1	1%
Sunk Capital Costs	0	0%
Other	12	10%
Have Considered Alternatives and Use These	6	5%
<i>Mains Water</i>	<i>1</i>	<i>1%</i>
<i>Recycled Water</i>	<i>2</i>	<i>2%</i>
<i>Other</i>	<i>3</i>	<i>3%</i>

3.9.3 Water Use reduction Activities

Just under half the sample (57 respondents) had made efforts in the past to reduce their use of water. The level of reductions reported are shown in Table 3.22.

Table 3.22 : Level Of Reduction In Water Use Achieved By Respondents

Level of Reduction in Water Use	Number of Companies
0% (no reduction in use)	61 (52%)
up to 20%	22 (19%)
21% - 40%	14 (12%)
41% - 60%	16 (14%)
> 60%	8 (7%)
Reduction made, but % not known	7 (6%)
TOTAL	118

Of the 57 companies reporting a reduction in use, only 3 reported changing their licence. Of these three, one was a farmer who now seriously regrets changing his licence when he stopped growing root crops. This serves to confirm the strong asset value that licences represent.

3.9.4 Incentives For Water Use Reduction

The incentives driving water use reduction for 56 of the 57 companies are given in Table 3.23.

Table 3.23 : Factors Influencing Water Reducing Measures (with percentages of total reporting)

Reasons for Undertaking Reductions in Water Use	Very influential	Fairly influential	Not influential
Cost of Water Abstraction	5	5	46
Limits on water supply / licence problems	15	8	33
New technology / process introduced for reasons other than water use minimisation	22	11	23
Company policy	13	13	30
Competitive pressures	2	9	45
Other	15	0	41

The most important reason was new technologies and processes. Nine of those mentioning the significance of new technologies and processes stated that the cost of effluent treatment, or the introduction of IPC had been important in their making the decisions they made. One more mentioned that the reasons related to measures taken to ensure the capacity of water treatment equipment was not exceeded.

Limits on water supply and licence problems relating to shortages were another important reason for reducing water use. Also significant is the company's policy. It is clear, though, that there is little incentive effect conveyed by the system of water abstraction charging itself. Three of the five enterprises mentioning that the costs of abstraction were significant were farmers.

In general, enterprises appear somewhat apathetic in their attempts to reduce water use (see Table 3.24). Only 34 seek water use reductions with any degree of enthusiasm. Of these, 31 claim to do so on a continuous basis. None of those seeking reduction continuously were spray irrigators, who may be charged on the two-part tariff system. On the other hand, 55 companies show no enthusiasm for reducing water use. The strength of the incentive from the abstraction charging system is demonstrably low, as responses recorded in Table 3.25 suggest. Five of the nine saying that the charge was highly significant were from the food and drink industry.

Table 3.24 : Companies Enthusiasm For Seeking Water Use Reductions

Frequency With Which Companies Seek Water Use Reductions	Number of Enterprises
Continuously	31
Periodically	3
As and when opportunities arise	15
Rarely	9
Never	55
TOTAL	117

Table 3.25 : Respondents' Views On The Strength Of Incentives Implied By Abstraction Charges

Strength of Incentive	Number of Enterprises
No incentive	78
Insignificant	14
Significant but insufficient to promote reduction in abstraction	16
Highly significant	9
TOTAL	117

3.10 Attitude Towards Unit Charging

Table 3.26 shows enterprises' responses to questions concerning their opinion of moving charging towards a per unit used scheme. Some irrigators commented that they were already on a two-part tariff. Opinions varied quite considerably. A number of those who were strongly opposed made comments to the effect that this would be a further nail in the coffin of British industry and was an extra cost that could not be borne by industry. Pulp and paper, and the food and drink sectors were relatively strongly represented in the camp that were opposed to the unit based system.

Table 3.26 : Attitude Towards Unit-Based Charging Scheme

Attitude Towards Unit Charging on Basis of Use	Number of Enterprises
Strongly supportive	14
Broadly supportive	25
Indifferent	25
Broadly opposed	18
Strongly opposed	23
Don't know	13
TOTAL	118

3.11 Enterprises Considering Applying for Licences But Not Doing So

Sixteen enterprises considered, but then did not apply for, abstraction licences. Seven were from the farming sectors and six were from the food and drink sector. Two were pulp and paper companies and the last was a textiles firm.

One company did not go through with the process because of its complexity, and one did not do so because of a combination of expense and complexity. One had a better alternative available, and the responses of the remaining thirteen are recorded in Table 3.27.

Table 3.27 : Reasons Given For Not Going Through With Licence Applications

Reasons Given

Rejected by Agency

Lack of co-operation from Agency

Referred until next year

Entered a sharing agreement with another company

Management buyout meant that the source could be shared with parent company

Told by Agency there was no point, area already over limits.

Too expensive and too much hassle

Worried that Agency would reduce limit, decided to keep head down as Agency kept on making excuses

Would sink borehole - costs would be halved as extracting from a supported source. Agency unlikely to give permission

Told that wouldn't get an increase

Because it rained

Not allowed to increase the license limit as the current limit was not being used - there were complications with nearby farmers complaining that extra abstraction would affect their water supply

Because of droughts, lack of water in aquifer - not allowed to increase license

The responses suggest that several of the applications were declined on the basis of drought-induced scarcity. The role of the Agency is clearly perceived as an important factor.

3.12 Commentary : Other Industrial Sectors

Table 3.28 below shows that in each region, there are more companies who have undertaken measures that have reduced water use than review their costs. Yorkshire and Anglia regions perform better than the other two. These are not the regions with the highest SUC. They are, however, regions where the scarcity of water, especially in drought years, has been more problematic than in the other two regions. The fact that more companies have undertaken use reduction measures than review costs re-affirms the belief that it is not the charging scheme per se that motivates reductions in use.

Table 3.28 : Whether Cost Are Reviewed, And Whether Water Reduction Activities Have Been Undertaken Broken Down By Region

	Costs Reviewed	Costs Not Reviewed	Don't Know	Water Reduction	No Water Reduction
Anglian	11	14	1	13	13
Welsh	6	18	1	11	14
Northumbrian	6	18	0	10	14
Yorkshire	15	23	1	20	19
TOTAL	37	73	3	54	60

Table 3.29 shows that a high percentage (55%) of those who do not review costs do actually know their abstraction charge. The percentage is slightly higher (66%) for those who do review costs. Perhaps most disturbing is the fact that 33% of those who claimed to review costs were not actually able to give a figure.

Table 3.29 : Knowledge Of Costs Related To Cost Reviews

	Costs Reviewed	Costs Not Reviewed	Don't Know	TOTAL
Know Costs	26	42	1	69
Don't Know Costs	13	34	2	49
TOTAL	39	76	3	118

Table 3.30 once again supports the view that it is not abstraction costs per se that motivate reductions in use. A relatively high percentage of those who do not know their abstraction costs (45%) have undertaken measures to reduce use of water. The percentage is only marginally higher (51%) for those who actually do know their abstraction costs.

Table 3.30 : Knowledge Of Abstraction Costs Related To Efforts To Reduce Water Use

	Reduce Water Use	Do Not Reduce Water Use	TOTAL
Know Costs	35	34	69
Don't Know Costs	22	27	49
TOTAL	57	61	118

Tables 3.31 and 3.32 below examine the influence of the way budgets are set on whether costs are reviewed or not, and on whether reductions in water use have occurred in the past. In both cases, it seems quite clear that where water abstraction charges are simply treated as part of the overall budget, performance is much worse than where budgets are set within a smaller sub-set of cost items. What is quite striking is the fact that all of those who treat abstraction

Table 3.31 : Enterprises' Review Of Costs Related To Manner In Which Budgets Are Set

	Costs Reviewed	Costs Not Reviewed	Don't Know	TOTAL
Separately from other items	10	6	1	17
Within environmental expenditure	7	4	0	11
Within water services expenditure	3	2	0	5
Within another group	6	5	1	12
Treated as part of overall expenditure	12	57	1	70
Don't know	1	0	0	1
No response	0	2	0	2
TOTAL	39	76	3	118

Table 3.32 : Enterprises' Efforts To Reduce Water Use Related To Manner In Which Budgets Are Set

	Reduce Water Use	Do Not Reduce Water Use	TOTAL
Separately from other items	8	9	17
Within environmental expenditure	8	3	11
Within water services expenditure	5	0	5
Within another group	6	6	12
Treated as part of overall expenditure	29	41	70
Don't know	0	1	1
No response	1	1	2
	57	61	118

charges as part of a water-related budget, and a large percentage (73%) of those who treat abstraction charges as part of an environmental budget, have made use reductions over time. Given the weakness of the price incentive, it would be controversial to state that this reflects a stronger price signal being conveyed to those where budgets are more narrowly set. There may be something to be said for the fact that setting budgets in this manner reflects a greater environmental concern, or in this particular case, greater concern with water use issues.

One of our hypotheses was that where licences are the responsibility of only one person, there would be more consistent decision making regarding licences. This hypothesis is not strictly testable in this study. Some information concerning the issue is shown in Tables 3.33 and 3.34 however. Whilst it appears that costs are more likely to be reviewed in such circumstances, it is in the cases where responsibilities are held by more than one person which show the higher percentage of cases where use has been changed. This may reflect (again) the weakness of the price incentive. Indeed, given the asset value of licences, unless there are clear benefits to be gained from contingent changes that would accompany reductions in use, it may not even be rational (in the sense implied by economic orthodoxy) to reduce water use.

Table 3.33 : Influence Of Way In Which Responsibilities Are Held Upon Review Of Costs

	Costs Reviewed	Costs Not Reviewed	Don't Know	TOTAL
Responsibilities Held By One Person	28	55	2	85
Responsibilities Held By More Than One Person	11	21	1	33
TOTAL	39	76	3	118

Table 3.34 : Influence Of Way In Which Responsibilities Are Held Upon Efforts To Reduce Water Use

	Reduce Water Use	Do Not Reduce Water Use	TOTAL
Responsibilities Held By One Person	35	50	85
Responsibilities Held By More Than One Person	22	11	33
TOTAL	57	61	118

3.13 Results from Water Companies Survey

3.13.1 Company Details

Water Service Companies

These companies have turnovers ranging from £320 million to over £837 million. Employee Numbers are typically of the order 2000. Each of the companies provides a form of environmental report, some reporting that the production of an environmental activity report was a statutory requirement. One company produces an environmental report at the Group level. The water group prepares a conservation report annually which is seen as an expensive exercise primarily with PR goals in mind. It is clear that drought conditions influence companies' environmental work, some of this focusing on the protection of sensitive sites designated under (for example) the Habitats Directive.

As regards environmental management, one of the companies is trialling a system and in another, the water quality part of the business operates under ISO9000 Quality Management, (not ISO 14000). The other two had no system in place.

Water Supply Companies

These companies range in turnover from £8 million to almost £16 million. Typically, they have close to a hundred employees. Two of the three produce Environmental Activity reports, the third proffered no information of this nature. No EMS was in place.

3.13.2 Licence Information

Water Service Companies

It is clear that the privatisation process has set in train a number of processes in which water service companies have started to alter the way they operate. one company commented on the fact that the process meant that the largest operators were confronted with an independent regulator for the first time. Licences have been discovered which were being exceeded, and others have been ‘found’, being largely unused in the past. This suggests that increased reliability of abstraction data may be a positive spin-off from the privatisation process.

Some companies who have sought to change licences have now had time limits placed upon these, presenting strategic issues when these fall for renewal.

Three of the four companies each have around 200 licences. The fourth has only thirty to forty licences. It is clear that some licences may cover several points of abstraction, whilst in other cases, one abstraction point may be covered by several licences. Total licenced volume for the four companies is given in Table 3.35. It is also the case that for some companies, it is a small number of very large licences which account for the bulk of abstraction.

Table 3.35 : Information Concerning Water Service Company Licences

Number of Licences	Total Licenced Volume	Source of Abstracted Water (no. of licences)	Source of Abstracted Water (Volume)
200	1780 MI/d 2000 MI/d (est.)	90% Groundwater, 10% Surface water mostly rivers, some boreholes	50% Groundwater, 50% surface water mostly rivers, some boreholes
215	2100 MI/d (ave.) 2550 MI/d (max)		
202	2210 MI/d (max)	90% river / reservoir, 10% groundwater	90% river / reservoir, 10% groundwater

Water Supply Companies

Similar information as provided above for the water service companies is presented below for the water supply companies (Table 3.36). The water supply companies have a much smaller numbers of licences.

Table 3.36 : Information Concerning Water Service Company Licences

Number of Licences	Total Licenced Volume	Source of Abstracted Water (no. of licences)	Source of Abstracted Water (Volume)
n.i.	120 Ml/d (max.)	100% Groundwater	100% Groundwater
1	96 Ml/d	River	River
4	48 Ml/d + 2Ml/d (just purchased) and 2 Ml/d (temporary from EA)	1 Reservoir, 2 River, 1 Groundwater	32.5 Ml/d Reservoir, 13 Ml/d River, 2.5 Ml/d Groundwater

3.13.3 Percentage Of Total Licensed Volume Abstracted (Headroom Issues, And Strategic Issues Arising

Water Service Companies

The Agency requires companies to forecast forward to the year 2025 and plan accordingly. Companies vary in the amount of headroom they possess from close to 50% to a situation where demand effectively outstrips supply.

This suggests that inter-regional transfers would be a useful tool to even out demand problems. Water is difficult to move large distances as it is a heavy and cheap resource. The extent of such transfers varies across regions, and they are somewhat politicised by the fact that different SUCs apply. Where regions in surplus have higher SUCs, regions with deficits will seek to gain access to these in such a way as limits their exposure to threats from drought without having to incur the high SUCs. Some companies will face strategic issues when time limited licences come up for review, especially where the resource situation is already tight.

One company, though apparently well placed to meet demand, felt that in some ways it had relatively little slack in the system, or scope to reduce licensed quantities, as these were needed to guarantee security of supply. Over the last few years slack has been reduced, as the division responsible for water supply has been routinely quizzed internally as to whether they need all licenses. This was the case despite the potential (perceived) strategic value of holding licences to frustrate other company's 'inset' licences (where licences in one region are used by a company in another). The pressure from Board level to do this was also mentioned another company, to some extent raising questions about non-specialist Executives' ability to make wise decisions concerning licences.

Water Supply Companies

Similar considerations apply in respect of water supply companies. The headroom varies between 30% and virtually none. Again, in the case of companies where headroom is limited, the issue of time limited licences is an important one.

3.13.4 Costs Of Licences

Water Service Companies

i) *Financial (payments to the Agency)*

The financial payments to the Agency are as set out in Table 3.37.

Table 3.37 : Financial Payments To The Agency From Water Service Companies For Abstraction

Annual Charge	As % Turnover
£7 million	<1%
£13 million	4%
£3.8 million	<1%
£5.9 million	1%

The variation in payments for abstraction affects the cost of water for the companies concerned.

ii) *Administrative Costs*

The administrative costs associated with managing the abstraction charges are typically of the order £150,000. There are, however, other forms of administrative cost which apply. These relate to making applications for new licences and renewing old ones. Different companies have different experiences in this latter respect reflecting the relative strength of their need for water. Associated with this, there may be costs from the need to carry out environmental impact assessments, which may range from £5,000 to £750,000 depending on the nature of the licence and the sensitivity of location.

Water Supply Companies

i) *Financial Payments To The Agency*

Financial payments for abstraction for water supply companies are shown in Table 3.38..

Table 3.38 : Financial Payments To The Agency From Water Service Companies For Abstraction

Annual Charge	As % Turnover
£430,000	3%
£140,000	1.75%
£100,000	<1%

ii) *Administrative Costs*

As with the above, the administrative cost is seen to be low, 'peanuts' in the words of one respondent.

3.13.5 Experience Of Dealing With E.A.

Water Service Companies

All companies said they enjoyed good relations with the Environment Agency. The most important issues, however, related to the perceived inefficiencies in administration. Applications for new licences and renewal invariably took a long period of time, always in excess of the three month period intended. Typically, they took more than a year. Often, they took over two years. Companies want to know where money is going. they are concerned that they are paying for Agency functions which are not meant to be funded by abstraction licence charges.

The other issue raised was the feeling that the Agency, in seeking to be transparent, and in its quest for auditable systems, was increasing complexity too greatly. One company felt that the Agency was being seen to be tough on what the public perceived to be money-grabbing water companies. They were being placed in a position by NGOs to act as a tough regulator rather than in an even-handed manner. Another company felt that the Agency imposed higher standards upon it than it did on other abstractors.

Water Supply Companies

The only further comments to be added from the water supply companies was that there appears to be internal inconsistency between different levels of Agency operation. Promises made at a more centralised level were often diluted at more local levels. The slow pace of decision making at the Agency was again singled out.

3.13.6 Perception Of The Level Of Charges

Water Service Companies

No company had problems with the level of charges. However, three companies voiced concern at the above inflation increases they had experienced at some stage over the last few years. They were unclear as to where the extra money was going. One company was becoming worried that abstraction charges were beginning to subsidise other EA activities and were not related to the cost of managing water resources. They pointed to evidence in the EA Corporate Plan that £5m surpluses from water charges were being set aside for other uses. One company said that it would be prepared to pay more if this was guaranteed to speed up the EAs decision making process, though it was suspected that inefficiency in the system existed which could be reduced. Another company would like a rebate for sources that were not used during the year.

Water Supply Companies

The water supply companies echoed concerns about above inflation increases, but the level of the charge was not perceived to be too much of a burden. One company said that part of the reason for increases in licences was to pay for improvements in resources in other parts of the region. They thought that it was inequitable that these improvements were only of benefit to other companies. The fact that the principal beneficiary was a company with lower levels of metering than the company interviewed was also mentioned.

3.13.7 Incentive Effect Of Current Charges

Water Service Companies

All companies said that there was no incentive effect in the current charging regime. One company mentioned that the charge represented around 5% of total costs, and another put the figure at 10% of variable costs, of water production. The other two companies pointed out that even if the charge increased dramatically, the regional design of system gives no incentive to reduce costs. As the EA has targets for how much cost must be recovered in each region, if a company dramatically rationalised its licences, all that would happen is that the Standard Unit Charge would increase. One company explained that it paid 97-98% of all charges in the region, so it was irrelevant how large the licences held were, as the EA would still need to recover the same amount of money. This company supported a national scheme, so that water companies could compete against each other to reduce abstractions.

Water Supply Companies

The water supply companies also all perceive that there is no incentive. One company said that theoretically it had an incentive not to have a bigger licence than it needs. It had considered reducing its licence, but decided that there was a risk of not getting it back if it was required in the future. Another company mentioned that any potential incentive was dampened by the regulated nature of the business and its ability to pass costs onto consumers (OFWAT permitting). It also stated that the cost of developing new resources was 20-30% of the cost of economising on water use through demand management, so there was an imbalance between the financial cost of reductions in use and the costs of developing new resources. One company expressed desire for more incentives for it to conserve water, it pointed out that the costs of abstraction are 1.4p per m³, the total cost of water is 5p per m³, and water is then sold at 60p per m³.

3.13.8 Opinions Concerning Current Charging System

Water Service Companies

Most of the companies questioned had few immediate concerns about the way the charge was calculated and the various bands. One company thought that the 3 times cost factor for supported sources was perverse, in that it penalised companies' abstractions from rivers which

are more environmentally robust. Charges reflect infrastructure rather than impact of abstractions. It was recognised that in many cases Standard Unit Charge does not reflect scarcity of resources in the region. Another company was supportive of current regional charging as does not see why its consumers should pay for the water resource problems of other areas. It also expressed concern at the impact of regional transfers by other water companies. Transfer of water from catchments leads to eventual discharge in other rivers, benefiting distant catchments. Large abstractions can cause constraints down stream (and increased costs) for the local water company. Feels that the exporting companies do face correct cost.

Water Supply Companies

One company felt that costs should vary along catchment in relation to environmental impact. Sees that its abstractions are low impact compared to those upstream, so should pay less. Another company thinks that its unsupported abstractions charges are subsidising the development of supported sources elsewhere, which it will not benefit from. Another company would like to see more punitive costs for spray irrigation in the peak of summer, when flows are low.

3.13.9 Attitude Towards Per Unit Incentive Based Charging Scheme

Water Service Companies

Most water service companies would be happy with a unit charging system conditional on changes to the existing system. Two would like to see the regional system of charging scrapped so that they would not continue to pay the bulk of their region's charge irrespective of use levels. Another company, apparently ignorant of the two-part tariff system, claimed that Agency income would be uncertain because (especially) spray irrigators' use would vary from year to year. The same company was unsure that the Agency would be able to handle such a system, commenting on the 'appalling' system of sending out invoices. Finally, one company was happy to see such a system as long as they were free to pass the charge on. Ideally, they would like to see any revenue generated recycled back into environment related expenditure programmes, and capital programmes to assist in meeting standards laid down in European Directives.

Water Supply Companies

One company was very enthusiastic about unit based charging. Something like a two-part tariff would be preferable acknowledging that to have only a unit charge would be to make future planning difficult. Another said that a pure unit system would not be fair as it would give incentives to companies 'to hog fat licences.' This company also thought that a mixed system would be best.

3.13.10 Management Of Licences (Distribution Of Responsibilities)

Water Service Companies

In all water companies management of the licence is co-ordinated by one person or department. Compliance is often monitored at individual sites, with problems reported upwards, and financial issues reported to the management accountants. One company had a water production budget set, so any changes in the charge would force them to find savings from somewhere else within that budget. As such, there was pressure to reduce expenditure on licences. They reviewed the costs annually when the Standard Unit Charge was announced.

Water Supply Companies

The companies had one person responsible for all aspects of the consent. In one case this was the Managing Director, and in another the person responsible sat on the Board of Directors. The latter person commented that there was no pressure to reduce licence costs since the company was fully aware of the value of licences. He would be sacked if he reduced licence availability.

3.13.11 Comment

The effect of the licence charging system per se appears to be limited as far as the water companies are concerned. An issue worthy of further examination is whether 'water-knowledgeable' individuals sit on a company's Board, where decisions concerning the budgets of the different divisions of the company are made. Companies lacking such individuals on their Board may be more inclined to treat licence costs (or the budgets of which they are apart) as requiring reduction in line with other drives for increased efficiency. Where such individuals are represented on the Board, however, the importance of licences in the strategic sense is more likely to be recognised so that money to pay for licences will be found (more or less) irrespective of the cost.

This does not mean that the latter companies are less likely to economise on water use. Indeed, one such company was the most keen to see incentive based unit charging since this would reward its attempts to reduce end-user demand through metering.

To the extent that a few companies felt that the Agency was seeking to be seen as 'whiter-than-white' (or 'greener-than-green') by taking a strong stance in its regulatory role (much stronger than the companies would like), an incentive-based charging system was seen by one company as a way of reducing that pressure. The problem with this view is that, to the extent that such incentives encourage reductions in use, they also encourage evasion. To some extent, therefore, the need for tight regulation may increase.

It is clear that, even with full cost pass through, even a major percentage change in charging for abstraction licences would (or should) have a relatively small impact on consumer prices. Much depends on pricing strategies in the companies concerned, but the impact on water

supply costs of a 100% charge increase would appear to be of the order 5% (of costs) and rather less in terms of final prices.

4.0 EFFECTS OF CHARGING FOR DISCHARGE CONSENTS

4.1 Survey Sample

The companies questioned about their discharges to controlled waters were from the same regions and sectors as those questioned about abstraction licences. The final survey sample frame is shown in Table 4.1, which illustrates both the initial target number of interview by sector and region and the number of actual interviews undertaken.

The final sample is slightly below the original target of 104 interviews, with 97 completed. On a sectoral basis, this result reflects the difficulties encountered in locating textile companies with discharge consents, whilst on a regional level obtaining interviews in Northumbria was also problematic. The initial sources of data, the Environment Agency Region's databases of discharge consents, were supplemented by industry federation membership lists for paper and textile sectors in order to trace suitable companies. In the textiles sector it appears that liquid effluent is often disposed as trade effluent to sewers, and that the industry is agglomerated in certain geographic locations (e.g. Lancashire). These findings may explain some of the difficulties encountered in filling the original survey frame.

The results of the survey are presented in the following sections.

- Characteristics of the Companies Surveyed
- Environmental Awareness of the Companies
- Internal Management of the Consent System
- Characteristics of the Discharge
- Costs of Discharge
- Incentive effects to change nature and quantity of discharge

4.2 Characteristics of the Companies Surveyed

Figures 4.1 and 4.2 show the size of the companies surveyed. Two measures of size were used: turnover and number of employees. The companies sampled tend to be larger companies, with over 40% having turnovers in excess of £10 million. The split by employees shows that around 15% of those interviewed were small organisations with under 20 employees. The majority of those surveyed have over 100 employees.

Table 4.1: Sample Survey Frame For Discharge Consents: Completed And Planned Interviews

Type of Organisation	Anglian Region		Welsh Region		North Region (Northumbria)		East North Region (Yorkshire)		East Other		Total	
	Actual	Target	Actual	Target	Actual	Target	Actual	Target	Actual	Target	Actual	Target
Water Service Company	1	1	1	1	1	1	1	1	0	0	4	4
Power Generation	1	1	0	1	2	1	2	1	1	0	6	4
Chemicals	11	8	4	5	5	7	7	5	0	0	27	25
Textiles	1	5	1	6	0	5	3	6	0	0	5	22
Pulp and Paper	2	0	6	5	2	3	4	6	0	0	14	14
Food and Drink	11	9	5	6	6	7	4	5	0	0	26	27
Fish or Cress Farming	2	2	5	2	2	2	3	2	0	0	12	8
Agriculture	2	0	0	0	0	0	0	0	0	0	2	0
Other	1	0	0	0	0	0	0	0	0	0	1	0
Total	32	26	22	26	18	26	24	26	1	0	97	104

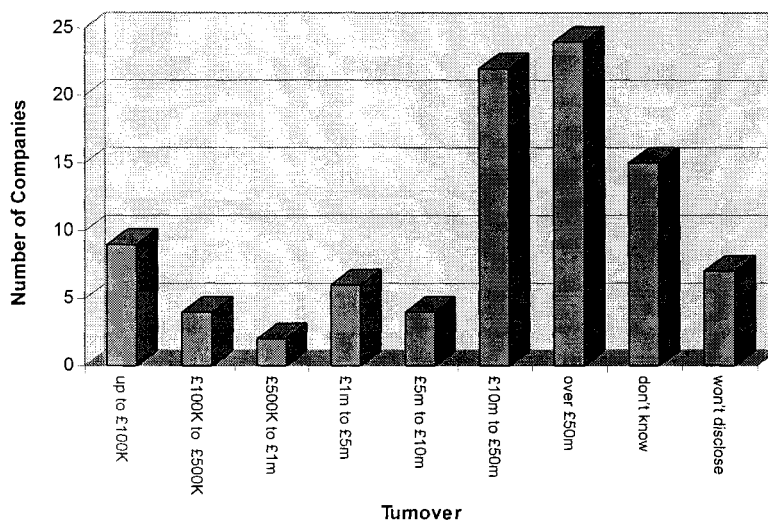


Figure 4.1: Survey Sample Broken Down By Company Size (Turnover)

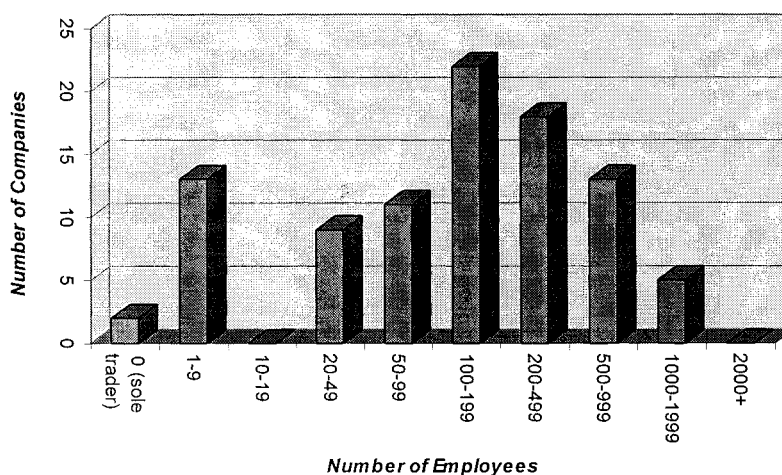


Figure 4.2: Survey Sample Broken Down By Company Size (Employees)

4.3 Environmental Awareness of the Companies

The environmental awareness of companies may be an important factor in explaining an organisation's familiarity with the consent system and capacity to react to and bring about changes in its behaviour. A number of factors were examined, these included operation of processes receiving IPC authorisation, existence of environmental management systems and production of annual environmental reports. Evidence of these indicators helps develop a picture as to the level of environmental awareness in the survey sample.

4.3.1 IPC Authorisations

Figure 4.3 shows that two fifths of the firms in the survey operate a process that is IPC authorised. This suggests that knowledge of emissions should be fairly strong in a substantial portion of the companies. However this result does not mean that 41% of discharges in the survey are from IPC processes. It was found that some companies with IPC are discharging some effluent to sewer, or tankering to off-site treatment or disposal. Their discharges to controlled water were from non IPC sources, such as site drainage. The relatively high level of companies operating IPC reflects the nature of the sectors selected for analysis in the study.

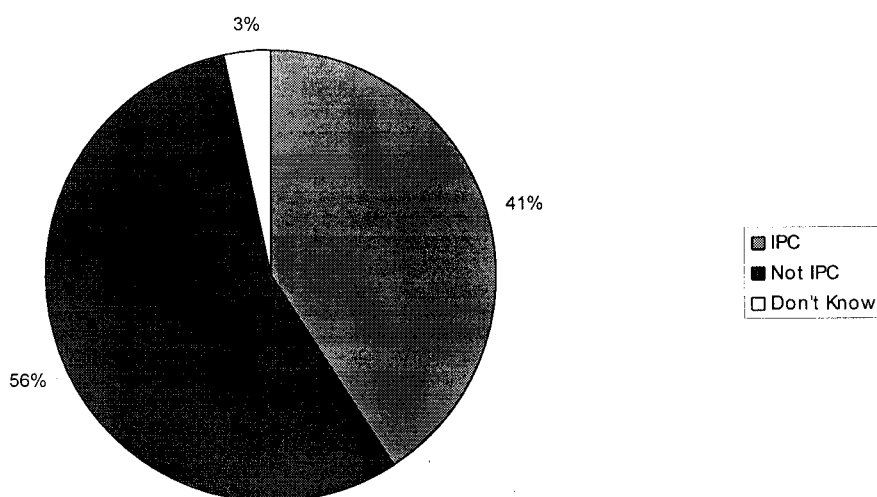


Figure 4.3: Number Of Companies With IPC Authorisations

4.3.2 Environmental Management Initiatives

Of the 93 firms surveyed over half (55%) participated in some form of environmental initiative or had an environment management system in place. Some 16% of companies operated more than one scheme (see Figure 4.4). The most common initiative was ISO 14000 (14%), followed by Responsible Care from the Chemical Industries' Association (10%). Further assessment of the type of schemes (see Figure 4.5) shows that most common response (28%) was 'other'. This largely consisted of internal, non-accredited, environment management systems or membership of local initiatives such as waste minimisation clubs.

Companies were also asked whether they produce annual environmental reports. Some 41% of the sample (38 companies) undertake such an exercise. However six of these companies producing an environmental report had no form of environmental management initiative. For the survey sample as a whole, levels of reporting are in general lower than levels of management schemes.

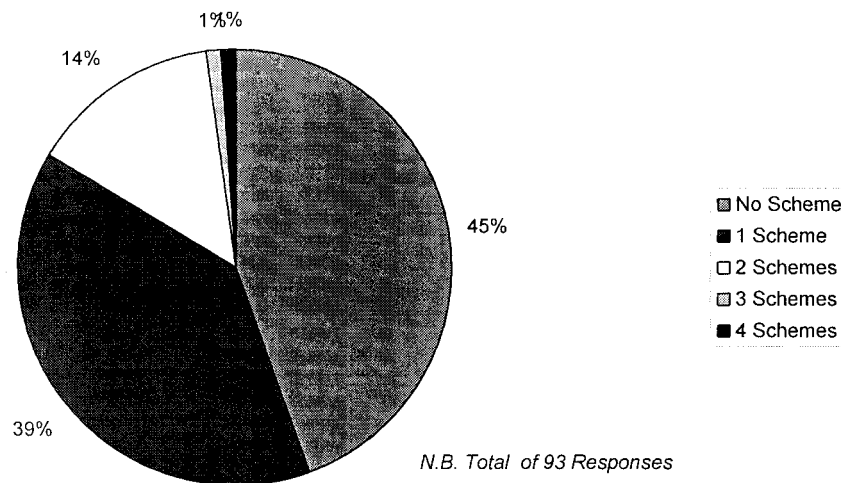


Figure 4.4: Number Of Environmental Management Schemes By Company

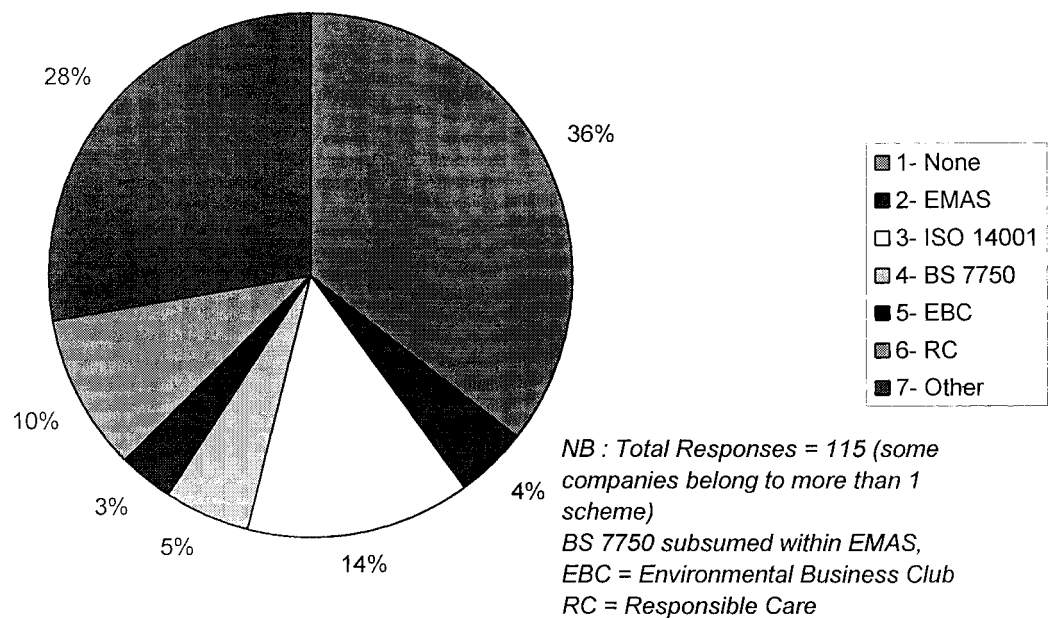


Figure 4.5: Survey Sample Split By Environmental Management Scheme

Table 4.2 shows the distribution of environmental reporting management initiatives by industrial sector and company size. There appears to be a correlation between company size and the levels of both reporting and participation in environmental management initiatives. Though the small sample size may prevent strong conclusions being drawn, across the sectors there appears to be highest number of environmental initiatives in the power generation and chemicals industries. Given the nature of agriculture and aquaculture businesses it is not

surprising to find that formal management systems and reporting of environmental issues are absent.

Table 4.2: Environmental Management Schemes And Reporting By Company Size And Sector

Sector	Total	With EMS		With Env Report		With Both	
Power Generation	6	6	100%	6	100%	6	100%
Chemicals	27	22	81%	15	56%	14	52%
Textiles	5	2	40%	1	20%	1	20%
Pulp and Paper	14	8	57%	7	50%	4	29%
Food and Drink	26	13	50%	9	35%	7	27%
Fish Farming	12	0	0%	0	0%	0	0%
Agriculture	2	0	0%	0	0%	0	0%
Other	1	1	100%	0	0%	0	0%
	93	52	56%	38	41%	32	34%
Size Band	Total	With EMS		With Env Report		With Both	
0 (sole trader)	2	0	0%	0	0%	0	0%
1-9	13	0	0%	0	0%	0	0%
10-19	0	0	-	0	-	0	-
20-49	9	3	33%	1	11%	1	11%
50-99	11	7	64%	5	45%	4	36%
100-199	22	13	59%	10	45%	7	32%
200-499	18	13	72%	10	56%	8	44%
500-999	13	11	85%	8	62%	8	62%
1000-1999	5	5	100%	4	80%	4	80%
	93	52	56%	38	41%	32	34%

4.3.3 Conclusions

The indicators of environmental awareness used in the study show that levels of environmental awareness should be fairly high in a minority of the companies surveyed. Differences are apparent in different industrial sectors and company size. The largest and potentially most polluting industries have the most procedures in place.

4.4 Internal Management of Consent Systems

The ability of companies to respond effectively to the consent charging system will depend in part on the ability and awareness of company management. Good co-ordination between the functions of obtaining and revising consents, responsibility for compliance with consent terms

and the keeping track of the financial cost of licences were all used as indicators of the ability of companies to anticipate and react to the consenting regime.

4.4.1 Distribution of Management Responsibility

The survey asked companies to specify the people who were internally responsible for managing the consent process. Management responsibility was categorised in three ways.

1. responsibility for obtaining and revising the consents;
2. responsibility for overseeing compliance with the consent; and
3. responsibility for keeping track of the financial cost of the consents.

The results in Figure 4.6 show that in the majority of the companies questioned (62%), the same person is responsible for all aspects of the consent process. In the remaining companies, most have one person responsible for two areas (26%). Some 12% of those surveyed appear to have fragmented management of the licence, with responsibility vested in three different people. One could hypothesise that the more fragmented the responsibility for licences, the less coherent will be management response to the licence system (although much depends on the way the different parties communicate where responsibility is diffused).

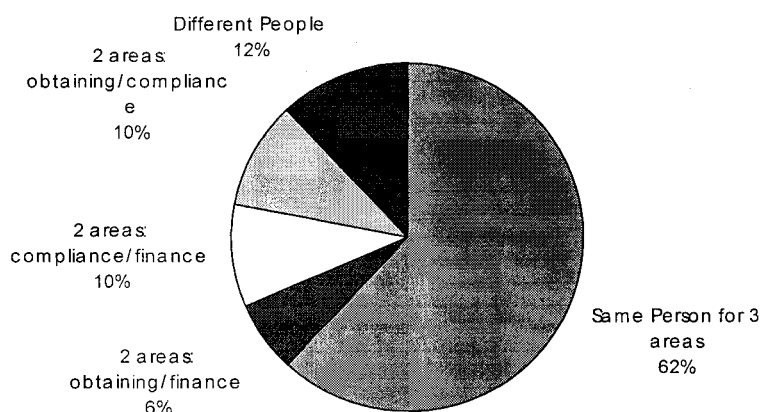


Figure 4.6: Number Of People Responsible For Licences

The chart below shows the level of seniority of the staff who deal with the consent procedures. The total number of people involved sums to more than the total number of companies, as more than one staff member can be involved. The results in the table below show that senior staff have a high level of involvement in the management of the consent.

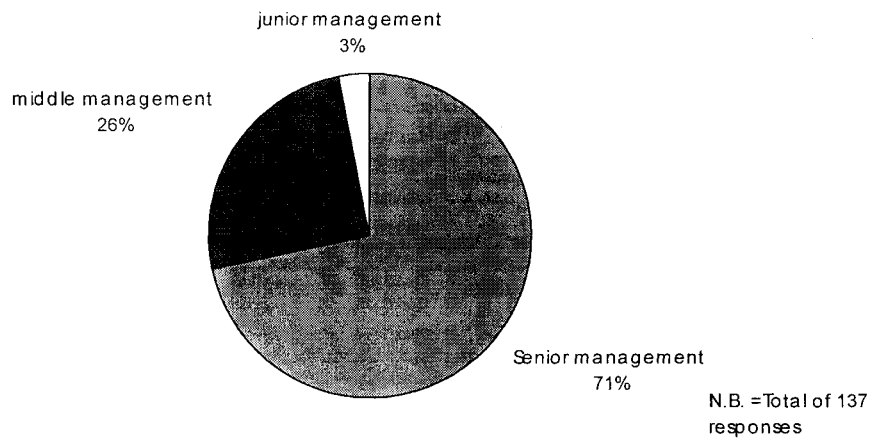


Figure 4.7: Seniority Of Management Involved In Consent Procedures

The job description of those involved in the consent procedure was also elicited. The chart below shows the management function of those with responsibility for the consent. Overall there is a wide distribution between the identified management functions, though in around half the sample responsibility is linked to environmental management or production functions.

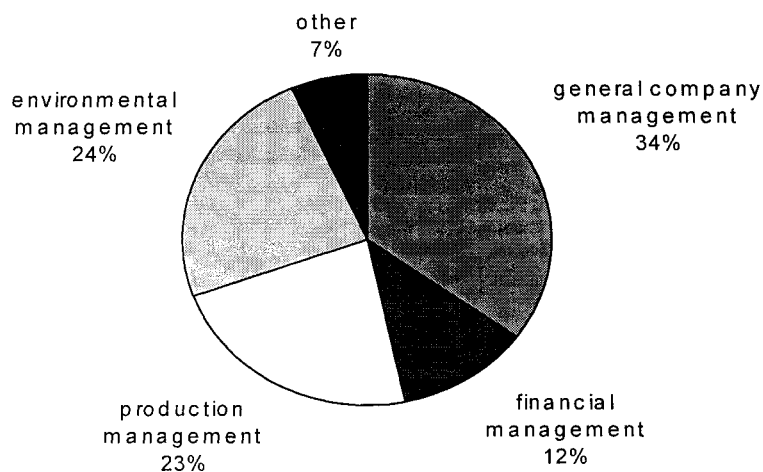


Figure 4.8: Function Of Management Involved In Consent Procedures

The assessment of management responsibility suggests that consents are treated at a fairly high level within the companies surveyed, as in the most part senior people have a high level of involvement. There also appears to be a high level of co-ordination in the management of the different aspects of the consent, with responsibility vested in one person in the majority of the companies surveyed. These results imply that in most cases companies may have a

good awareness of the current regime and will potentially responsive to any changes. To the extent possible, this hypothesis will be tested in later parts of the survey.

4.4.2 Incentive Schemes to ensure Compliance

Some 10 companies (11% of those surveyed) had schemes in place which gave an incentive to staff to ensure compliance. In most cases this was in the form of cash bonuses paid to staff, in other cases rates of compliance were one aspect taken into consideration during staff performance reviews. For the companies without direct financial incentives in place, the threat of prosecution or dismissal provided large enough incentive for compliance to be met. A couple of firms mentioned that internal company policies and ISO 14000 targets placed a high reliance on compliance, so thus providing an indirect incentive to employees.

4.4.3 Co-ordination of Management Responsibility by Industrial Sector and Company Size

The division of responsibilities for managing the licence procedure is shown, for each sector in the Table 4.3. This shows that for the majority of the companies surveyed (62%) all aspects of the licence are managed by the same person. However given the diverse nature of the companies studied this result may be skewed by the small owner run businesses (e.g. aquaculture) where responsibility will naturally rest with the same person. Trends in other sectors are more difficult to assess. There is however a substantial range between 20% (in textiles) and 77% (in food and drink). Overall, the small size of some samples may prevent firm conclusions from being drawn.

Table 4.3 Companies In Which All Responsibility Is Held By The Same Person

Company Size	All Responsibility held by Same Person	Total Co's Surveyed	Percent
Power Generation	2	6	33%
Chemicals	15	27	56%
Textiles	1	5	20%
Pulp and Paper	7	14	50%
Food and Drink	20	26	77%
Fish Farming	11	12	92%
Agriculture	2	2	100%
Other	0	1	0%
	58	93	62%

It is noticeable that links between the previously discussed indicators of environmental awareness and concentration of responsibility for licences do not appear strong. This contrast is most explicit with the power generation and fish farming sectors. The potentially high

awareness in power generation is not backed up by high levels of concentration of responsibility, the opposite being true of fish farming.

Table 4.4 shows responsibility split by size of the companies surveyed. This confirms that smaller companies are those which are most likely to have management responsibility focused through one person. For companies with less than 50 employees, 21 out of 24 companies (88%) had co-ordinated management responsibility. However for larger companies, the pattern of responsibility is far less clear. For companies with more than 50 employees, responsibility for licences was vested in one person in 54% of the companies. There also appears to be no apparent pattern between size of the company and the level of co-ordination of the consent procedures.

Table 4.4: Companies For Which All Responsibility For Licences Is Held By One Person (By Company Size)

Company Size	All Responsibility held by Same Person	Total Co's Surveyed	Percent
Up to 50 employees	<i>21</i>	<i>24</i>	<i>88%</i>
• 50-99	5	11	45%
• 100-199	14	22	64%
• 200-499	7	18	39%
• 500-999	9	13	69%
• 1000+	2	5	40%
sub total for all companies over 50 employees	<i>37</i>	<i>69</i>	<i>54%</i>
total	58	93	62%

4.4.4 Communication and Co-ordination

Companies in which the responsibility for licences is split between different people were asked how communication between the various actors was managed. Most companies had some means of management procedure in place (55%), though a couple of people commented that their formal procedure only came into action where there was a significant change or problem to be addressed. Companies listed as having 'other' form of communication, include those who often had both formal and informal contact with colleagues. Overall the results suggest that for most companies where more than one person is responsible for consents, there is some means of communicating information about changes taking place. Whether and how frequently these channels are used is not always clear.

Table 4.5: Management Of Licence Where More Than One Person Involve

Informally	11	28%
Management Procedure	22	55%
Don't Know	1	3%
Other	6	15%
Total	40	100%

4.4.5 Reviewing Costs and Setting Budgets

Companies were asked whether they reviewed the costs of their consent and how often this was done. The results are shown in Table 4.6. Over half of the survey sample (54%) do not review their discharge costs at all. Possible interpretations of this result are that the majority of those questioned perceive the charge to be a fixed cost, or that the charge is low so it is not worth reviewing. Of those that review costs, the majority of companies review on an annual basis which would be consistent with increases in the Environment Agency charges. In many ways perhaps the most interesting result is the small number of companies that review costs at frequent intervals. Why they should do this is not clear.

Table 4.6: Number Of Companies Reviewing Costs And Frequency Of Review.

	Number Companies	of %
costs reviewed	43	46%
• weekly	1	1%
• monthly	4	4%
• quarterly	5	5%
• 6 monthly	3	3%
• annually	23	25%
• other	7	8%
not reviewed	47	51%
don't know	3	3%
total	93	100%

4.4.6 How budgets are set in companies

The way in which budgets for consents are dealt with provides an indicator of the internal visibility of the financial cost of the consent. Having costs allocated to a specific budget increases the likelihood that a company is aware of its costs and sensitive to charges. Allocation of discharge costs to general overheads increases the likelihood of the cost of discharge being dissipated.

Figure 4.9 shows how organisations interviewed allocate budgets for discharge consents. The most common result was that water discharge costs are treated as part of overall expenditure

(36%). Responses for ‘other items’ included responses such as ‘budgets for all water services’, or ‘hidden within the IPC budget’. Overall the responses show that over half of companies surveyed have a budget for water discharge that is not treated as part of overall expenditure. This suggests that a good proportion of organisations may be sensitive to changes in licence costs.

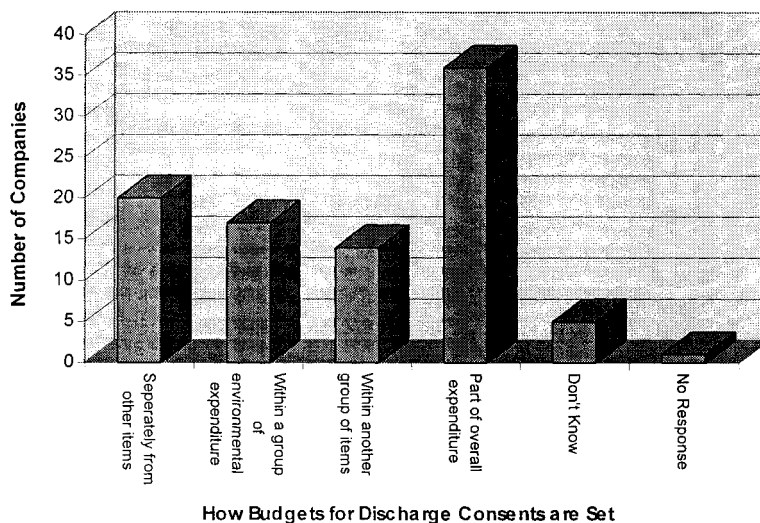


Figure 4.9: How Companies Set Budgets For Discharge Consents

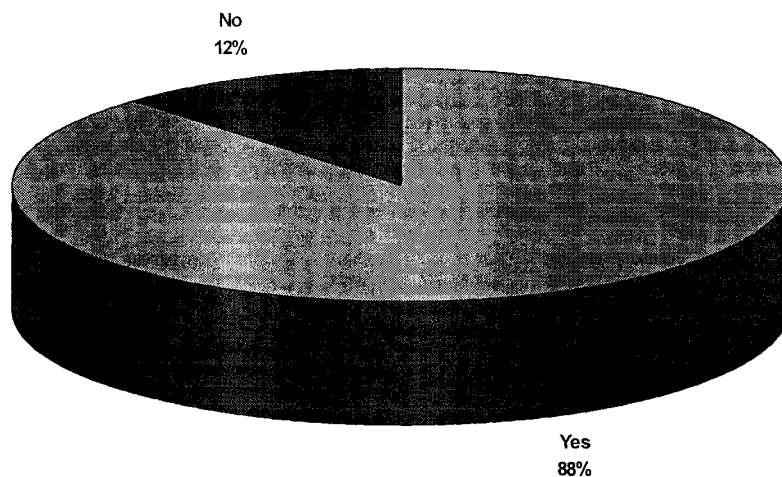
4.4.7 Level to Which Costs Reported

The final way in which the management of licences was assessed was whether the costs of licences were reported to senior management level. As Figure 4.10 shows the majority of the time this is the case. The result supports the finding that senior management have a strong level of involvement in the consent system.

4.4.8 Conclusions

The survey shows that the management of discharge consents within companies has diverse results. In many cases all functions of the consent system are managed at a senior level, and often the same person is responsible for all aspects of management of the licence. Where responsibility is split, formal communication often exists. Budgets for licence cost are often devolved from overheads and costs reported to senior level. We suggest these are positive factors associated with licence management.

FIGURE 4.10: LICENCE COSTS REPORTED TO SENIOR MANAGEMENT



However, the results also show that a majority of those surveyed never review costs, and that it is most common for discharge costs to be counted as part of overall expenditure. There also appears to be a variation between the type of companies identified in the previous section as having high environmental awareness and those with high levels of management coordination. This suggests that although the capacity of management appears to exist for managing the consent, it is not apparent that the cost of the consent requires or receives much attention.

4.5 Characteristics of the Discharge

Part of the survey questions consulted companies on the nature of their discharge. As well as providing a useful insight into the operating characteristics of the companies questioned, some important issues relating to companies familiarity with the current system emerged.

4.5.1 Knowledge of the Content Banding System

One interesting result was the high level of ignorance relating to aspects of the charging system. In particular, there was little familiarity with the content banding part of the charging system. Figure 4.11 shows that 72% of those questioned were unable to specify to which charging band their discharges belonged. The 18% of those included in discharge Band G includes some responses where the person questioned was very assertive in saying that their discharge was in the least hazardous band. However this unfamiliarity with the banding system must not be equated to ignorance of the nature of an organisation's discharge. Many interviewed were well aware of their consent limits for specific pollutants (for example BOD, COD and SS).

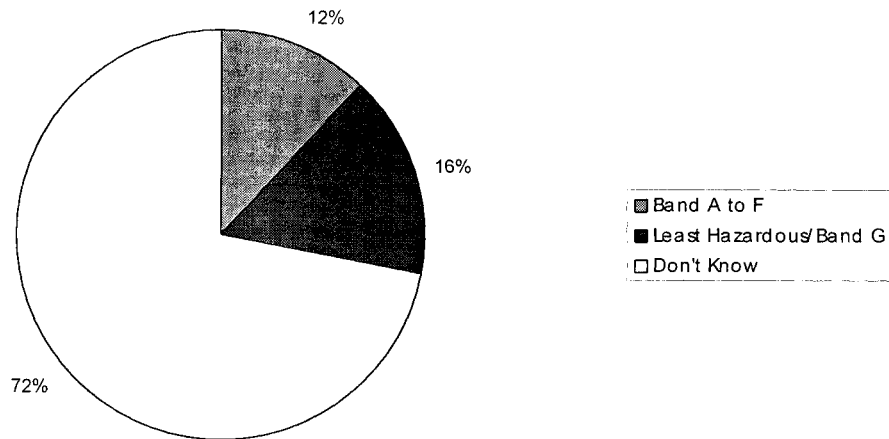


Figure 4.11: Companies Knowledge Of The Content Band Of Their Discharge

4.5.2 Average Quantities Discharged in Relation to Consented Volume

In order to understand the constraints and incentives on each organisation's discharges to controlled water, it is important to understand the proportion of consent limit currently discharged. This is shown in Figure 4.12. Of the organisations responding 90-100% a certain proportion may be in actually in excess of consented volumes. As this survey was undertaken on behalf of the EA it is unclear whether many firms would admit to being over a limit. The no response category included those firms who stated that they had no volume limit on their consent. Some of the responses were estimates as companies were unaware of their actual discharges. In general, it seems that the majority of firms questioned have consents that adequately reflect their waste water discharges. It was apparent that most firms valued any extra "headroom" as vital to business flexibility.

Table 4.8 and 4.9 show average proportion of consent used split by company size and sector. Both tables show a wide distribution of results, and no discernible pattern emerges

4.5.3 Main Source of Water Discharge

The origin of the water discharge is an important factor in understanding a company's attitude and behaviour towards the licencing system. For example, where a licence is wholly or primarily, related to site drainage it might be expected that awareness of the licencing regime is diminished as rainfall is not within the control of the company. On the other hand, where discharges water is the residue of a production process, it may be reasonable to assume that awareness of the regime and ability to influence discharge is higher.

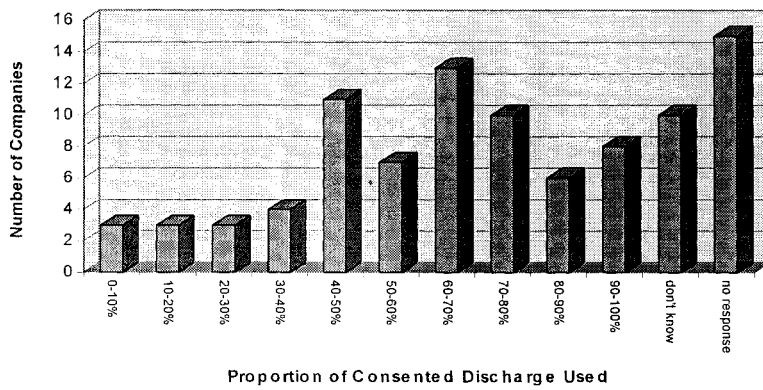


Figure 4.12 : Quantity Discharged In Proportion To Consented Volume

Figure 4.13 shows that for the surveyed companies, the most common sources of water discharge are process related, and that cooling water and drainage water are also common.

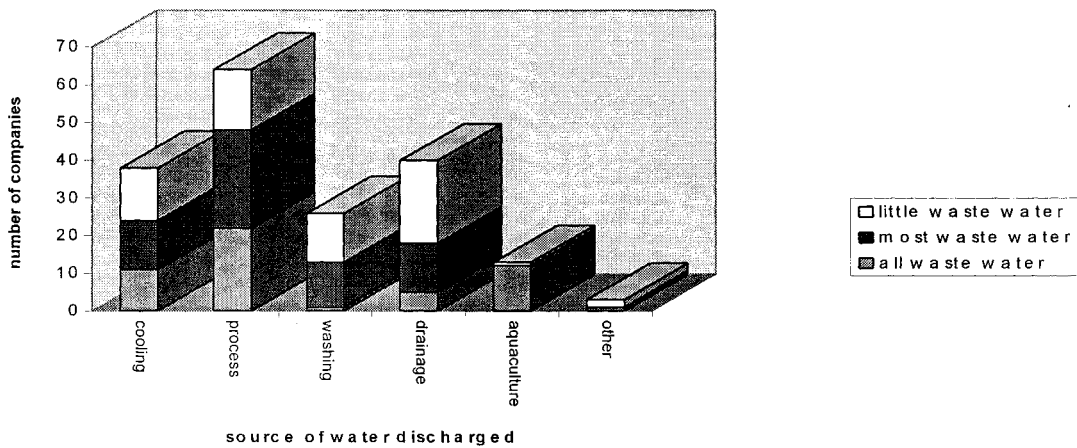


Figure 4.13: Main Sources Of Water Discharge

Table 4.8: Average Discharge Consent Used - By Company Size

	0-10%	10-20%	20-30%	30-40%	40-50%	50-60%	60-70%	70-80%	80-90%	90-100%	don't know	Total
sole trader	1	0	0	0	0	0	0	0	0	0	1	2
1-9	0	0	1	1	0	0	1	1	1	4	1	10
10-19	0	0	0	0	0	0	0	0	0	0	0	0
20-49	1	1	0	0	2	0	1	1	0	0	0	6
50-99	0	1	0	0	0	1	2	1	1	1	1	8
100-199	0	0	1	0	3	1	4	3	2	1	2	17
200-499	1	0	0	1	0	5	2	2	0	1	3	15
500-999	0	0	1	1	3	0	2	2	1	1	1	12
1000-1999	0	0	0	0	0	0	2	0	0	0	1	3
2000+	0	0	0	0	0	0	0	0	0	0	0	0
	3	2	3	3	9	7	13	10	5	8	10	73

Table 4.9 : Average Discount Consent Used - By Company Sector

	Proportion of Use											Total
	0-10%	10-20%	20-30%	30-40%	40-50%	50-60%	60-70%	70-80%	80-90%	90-100%	don't know	
Chemicals	0	1	1	1	3	4	7	3	2	0	0	22
Textiles	0	0	0	0	1	2	1	0	0	0	1	5
Pulp and Paper	0	1	1	0	1	0	2	4	2	1	0	12
Food and Drink	2	0	0	1	3	1	3	2	0	3	5	20
Fish Farming	1	0	1	1	0	0	0	1	1	3	2	10
Other	0	0	0	0	1	0	0	0	0	1	2	4
Total	3	2	3	3	9	7	13	10	5	8	10	73

4.5.4 Alternative Means of Water Disposal

In order to understand the ways in which companies react to the charging system it is important to understand whether respondents perceive they have alternative means of water disposal. Table 4.10 show the responses from a question asking whether alternative means of disposal had ever been considered. This shows that just under half had considered alternatives.

Table 4.10: Number Of Companies Who Had Considered Alternative Means Of Water Disposal

Considered alternative means of waste water disposal	Number of Companies	Proportion of All Companies
yes	43	46%
no	50	54%

Further examination of the reasons for companies not switching to other sources is shown in Tables 4.11 and 4.12. The first table shows responses from those who had considered alternative disposal, listing the reasons for not changing. The main reason for not changing discharge was expense. The second table lists the reasons given by companies who had never considered alternatives to their current way of discharge. The main reason was that most people were happy with their current arrangement. Volume and cost considerations were also important.¹

Table 4.11: Companies Who Had Considered Alternative Disposal: Reasons For Not Switching

Reasons for still discharging to controlled water	Number of Responses	Proportion of Responses
• alternatives too expensive	19	40%
• produce too large volume	5	11%
• infrastructure not available	6	13%
• already made change	4	9%
• change under consideration	4	9%
• constrained by process chemistry	2	4%
• have switched to discharge to controlled water from other source of disposal	1	2%
• effluent would kill treatment works bacteria	1	2%
• other	5	11%
total	47	100%

¹ We have kept these responses in the 'have not considered alternatives category, though it could be argued that to the responses given imply consideration of alternatives.

Table 4.12 : Companies Who Have Never Considered Switching - Reasons Given

Reason	Number Responses	of Percent
• never occurred to me	5	9%
• happy with current arrangement	19	33%
• anticipated problems with	8	14%
• perceived	12	21%
• lack of infrastructure	7	12%
• sunk capital into treatment	1	2%
• no alternative	1	2%
• no alternative (fishfarm)	2	3%
• other	3	5%
Total	58	100%

4.5.5 Conclusions

The companies surveyed have varied forms of discharge, so face different constraints. Those consented for drainage or agricultural activities often expressed the view that their discharge was beyond their control and that there was little they could do to influence it. Similar sentiments were also expressed by many other respondents, that water generation was fixed. It appears that a large proportion of companies have never considered making changes to their discharge. The main reasons for this seem to be the perceived cost of alternatives, though inertia also appears important as many had not considered alternatives as they were happy with current arrangements.

4.6 Costs of Water Discharge

4.6.1 Awareness of Cost of Water

A series of questions were asked regarding the awareness of the cost to the company of discharging to controlled waters. Table 4.13 shows that a high proportion of respondents stated that they were aware of the cost of their consents (80%) and the reason for the charge (73%).

Table 4.13 : Level Of Awareness Of Costs Of Discharge

	Yes	No	Don't Know/ No Response
Awareness of Annual Cost of Consent	80%	20%	
Aware of Reason Charge Levied	73%	17%	10%

These levels of awareness can be examined more closely through further analysis of responses to other questions. In addition to being asked whether they were aware of the purpose of the

consent, interviewees were asked to specify both the cost of their Discharge Consent and to specify what the purpose of the charge was. The following two tables (Table 4.14 and Table 4.15) document the responses. The responses in both table are cross tabulated against the results of the awareness questions.

Table 4.14: Ability To Provide Data On Cost Of Discharge

	Able to Provide Cost of Consent		Not able to Provide Cost of Consent		Total	
	Number	Percent	Number	Percent	Number	Percent
Aware of Cost	52	56%	22	24%	74	80%
Not Aware of Cost	7	8%	12	13%	19	20%
Total	59	63%	34	37%	93	100%

Table 4.14 above shows that not all those who stated awareness of the costs (22 companies) were able to provide details of the level of their charge. This result may not be surprising if the question required knowledge of the precise charge level. However the interviews were conducted in such a way that estimates, approximations and ‘ball park figures’ were all recorded as positive responses. Overall this result suggests that actual awareness of the cost of consents is lower than initial responses imply. The fact that some of the companies who were not aware of their costs were able to provide cost data can be explained by organisations looking up their costs, or making an estimate, during the course of the interview. Also since interviews were pre-booked, this gave those questioned opportunity to familiarise themselves with their consent charges. Therefore, it is possible that awareness of the costs will be higher than if the interviews had been conducted cold.

Table 4.15 shows the responses regarding the purpose of the charging regime. The table shows that 17 companies who claimed to know the purpose of the charge were not able to provide a reason when asked to do so. In addition, some of the reasons given for the charging system are inaccurate. Both these results suggest that overall awareness of the purpose of charges is much lower than implied by responses to the original question. Overall, it appears that around half the sample are aware of the cost of consent, and a similar proportion are aware of the purpose of the charging system.

4.6.2 Actual Cost of Charge

The previous section showed that 59 companies, or 63% of those interviewed, were able to provide estimates or details of the cost of their discharge consents. The average charge paid was £6,146 (see Table 4.18).

In order to benchmark this cost, and to understand what the level of charge means to a company’s business, the cost needs to be scaled in some way. The following two tables

Table 4.15: Perceptions Of The Purpose Of The Consent Charge

	Aware of the Reason for Charge
• To Fund the EA	7
• EA costs	7
• EA administration	6
• Testing/Sampling/Monitoring	14
• River Management	6
• Enforcement	2
• Pay for the Consent Process	3
• Pay for Water Treatment and Clean-Up	9
• Compensate for Environmental Impact	1
• Pay for IPC	1
• Because they are allowed to charge'	1
Total Responses	57*
Don't Know/No Response	17
Total	74

* responses recorded from 51 companies, some of whom gave more than one reason

(Table 4.16 and Table 4.17) show the consent charge in relation to the turnover of business. As some of those questioned would not disclose their turnover, the companies represented on the tables are only part of the survey sample.

Table 4.16 shows the EA charge in relation to the company turnover. The results have been ordered with the smallest organisations first, and the largest last. Companies are grouped into turnover bands and an average charge as a proportion of turnover has been calculated for each band. A number of results are apparent. First, the charge is a small proportion of turnover, for most companies it is below 0.1%. Second, the charge is a largest proportion of the smallest companies turnover, representing over 1% of turnover in three cases. The average for the grouping of smallest companies is 0.95%, the highest average of any sector. Third, there appears to be a broad trend where charge as a proportion of turnover diminishes as company size increases.

Table 4.17 shows the same Discharge Consent data as a proportion of turnover data, this time grouped by industrial sector. In the main, the small size of the survey prevents strong conclusions being drawn. However, it is noticeable the importance of the discharge costs to fish farmers are higher than all other sectors, mainly due to being small turnover businesses.

Overall the analysis of the cost of the consent in relation to turnover shows that in the majority of cases the cost is small, though there is some variability from business to business. It is apparent that the charge is most significant cost to the smallest companies surveyed, and that of the sectors examined, fish farmers have the largest burden.

Table 4.16 : Charge As A Proportion Of Company Turnover - By Company Size

Size Band	Actual Turnover	EA Charge	EA Charge as % Turnover	Size Band Average
up to £100K	10,000	374	3.74%	0.95%
	20,000	249	1.25%	
	40,000	0	0.00%	
	45,000	100	0.22%	
	50,000	25	0.05%	
	60,000	674	1.12%	
	78,000	187.25	0.24%	
£100K to £500K	140,000	375	0.27%	0.21%
	150,000	300	0.20%	
	160,000	200	0.13%	
	300,000	800	0.27%	
£500K to £1m	800,000	350	0.04%	0.04%
£1m to £5m	4,000,000	5500	0.14%	0.14%
£5m to £10m	8,500,000	1245	0.015%	0.01%
£10m to £50m	10,000,000	2500	0.025%	0.03%
	10,300,000	1095	0.011%	
	12,000,000	415	0.003%	
	12,443,200	6500	0.052%	
	15,000,000	3000	0.020%	
	16,000,000	3500	0.022%	
	18,500,000	20000	0.108%	
	20,000,000	35000	0.175%	
	21,000,000	415	0.002%	
	23,000,000	3735	0.016%	
	23,500,000	3550	0.015%	
	30,000,000	250	0.001%	
	30,000,000	5800	0.019%	
	40,000,000	1200	0.003%	
	40,000,000	2400	0.006%	
	40,000,000	3500	0.009%	
50,000,000	6000	0.012%		
over £50m	55,000,000	0	0.000%	0.02%
	55,000,000	80000	0.145%	
	65,000,000	1400	0.002%	
	70,000,000	3735	0.005%	
	80,000,000	14000	0.018%	
	100,000,000	13757	0.014%	
	120,000,000	2500	0.002%	
	123,000,000	17000	0.014%	
	167,000,000	8000	0.005%	
	200,000,000	5000	0.003%	
	200,000,000	25000	0.013%	
	290,000,000	1660	0.001%	
	750,000,000	3030	0.000%	

Table 4.17 : Charge As A Proportion Of Company Turnover - By Sector

Type of Organisation	Size Band (Turnover)	Turnover	EA charge	EA Charge as % Turnover	Sector Average
Power Generation	7	290,000,000	1660	0.001%	0.000%
	7	750,000,000	3030	0.000%	
Chemicals	6	10,300,000	1095	0.011%	0.017%
	6	18,500,000	20000	0.108%	
	6	21,000,000	415	0.002%	
	6	23,500,000	3550	0.015%	
	6	30,000,000	250	0.001%	
	6	40,000,000	3500	0.009%	
	6	40,000,000	1200	0.003%	
	7	80,000,000	14000	0.018%	
	7	120,000,000	2500	0.002%	
	7	200,000,000	5000	0.003%	
Textiles	1	40,000	0	0.000%	0.006%
	7	200,000,000	25000	0.013%	
Pulp and Paper	6	16,000,000	3500	0.022%	0.046%
	6	20,000,000	35000	0.175%	
	6	23,000,000	3735	0.016%	
	7	100,000,000	13757	0.014%	
	7	167,000,000	8000	0.005%	
Food and Drink	4	4,000,000	5500	0.138%	0.033%
	5	8,500,000	1245	0.015%	
	6	10,000,000	2500	0.025%	
	6	12,000,000	415	0.003%	
	6	15,000,000	3000	0.020%	
	6	30,000,000	5800	0.019%	
	6	40,000,000	2400	0.006%	
	8	50,000,000	6000	0.012%	
	7	55,000,000	80000	0.145%	
	7	55,000,000	0	0.000%	
	7	65,000,000	1400	0.002%	
	7	70,000,000	3735	0.005%	
Fish Farming	1	10,000	374	3.740%	0.748%
	1	20,000	249	1.245%	
	1	45,000	100	0.222%	
	1	50,000	25	0.050%	
	1	60,000	674	1.123%	
	1	78,000	187.25	0.240%	
	2	140,000	375	0.268%	
	2	150,000	300	0.200%	
	2	160,000	200	0.125%	
	2	300,000	800	0.267%	
Agriculture	3	800,000	350	0.044%	0.044%
Other	6	12,443,200	6500	0.052%	0.052%

4.6.3 Perception of the Level of the Charges

Companies were asked how they perceived the level of the charge paid for the consent. The results are shown in Figure 4.14.

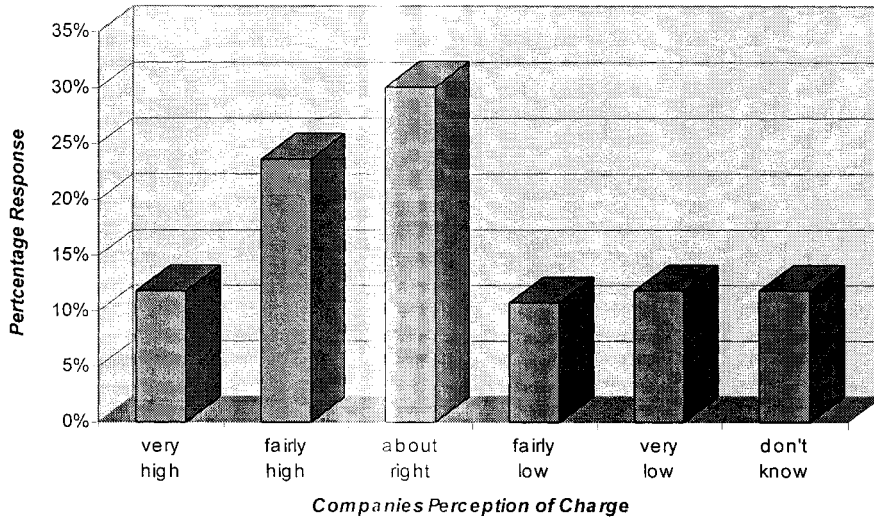


Figure 4.14: Perception Of Cost Of Consent

Given the small part of the overall turnover that the charge represents, it is perhaps surprising the number of people who perceive the charge to be very high or fairly high. For some respondents a commonly stated reason for this attitude was the limited service that companies felt that they were receiving in return for the charge. The opinion was that the charge was poor value for money as it did not reflect the amount of time the agency spent monitoring and sampling. Some respondents (especially from the fish farming sector) mentioned that they objected paying for discharge when the quality of the water returned to the river was higher than that they had abstracted further upstream. However, given that the companies interviewed were informed that the survey was for the Environment Agency, it may be unrealistic to expect many respondents to answer that the cost was low. They may perceive that such a response would have the effect of ultimately increasing charges.

Table 4.18 shows the relationship between the actual consent charges reported by companies interviewed and their perception of the cost of the consent. It is noticeable that those companies with a very high perception of the charge appear to pay the largest fees. In addition, those responding don't know/no opinion appear to be the smallest contributors. However there appears to be little noticeable variation between the average consent costs of the other companies and their perception of the cost. It is also very apparent that a large number of people were prepared to give their opinion to this question having not been able to provide details of the cost of their consents. This poses questions as to how such conclusions have been arrived at by these individuals and whether much weight should be placed on these responses.

Table 4.18: Perception Of Consent Cost In Relation To Charge Paid

Perception of Charge	Number of Companies	Average Cost of Consent
Very High	5	21,740
	6	no consent cost stated
Fairly High	15	4,361
	7	no consent cost stated
About Right	23	5,872
	5	no consent cost stated
Fairly Low	7	5,629
	3	no consent cost stated
Very Low	5	4,192
	6	no consent cost stated
Don't Know/No Opinion	6	899
	5	no consent cost stated
All Consents	93	6,146

4.6.4 Incentives Effects

The perception of the level of the charge can be contrasted with the incentive effects that it generates. Responses from the study suggest that incentive effects from the charge are perceived to be low. (See Table 4.19).

This result shows an almost reverse result to the perception question. Even though most companies perceive the cost to be high, the incentive effect of the charge is perceived as low. One explanatory reason may be that companies see the charge (correctly) as a means of financing the EA and not intended as a means to stimulate reductions in discharges. Alternatively, they may feel that they have no option other than to discharge their effluent.

Table 4.19: Financial Incentives From Current Discharge Consent Charges

Response	Financial Incentive to Change Volume	Financial Incentive to Change Load
No incentive	48%	57%
Insignificant	22%	12%
Significant	14%	17%
Highly Significant	11%	6%
No Opinion	5%	7%

4.6.5 Comparison Of Water Costs With Those Of Other Resources

A comparison can be made between the cost of water to companies and those of other environment related activities. Figure 4.15, 4.16 and Table 4.20 and 4.21 show the costs of discharge consents relative to the costs of discharge.

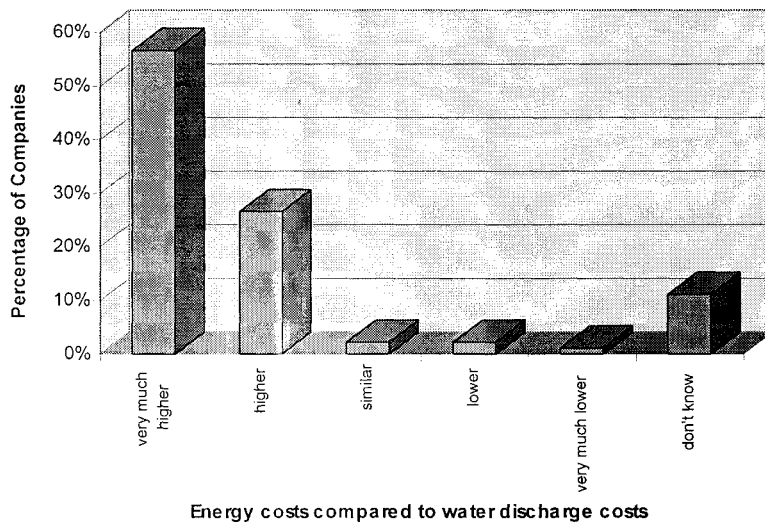


Figure 4.15 : Energy Cost Compared To Charge

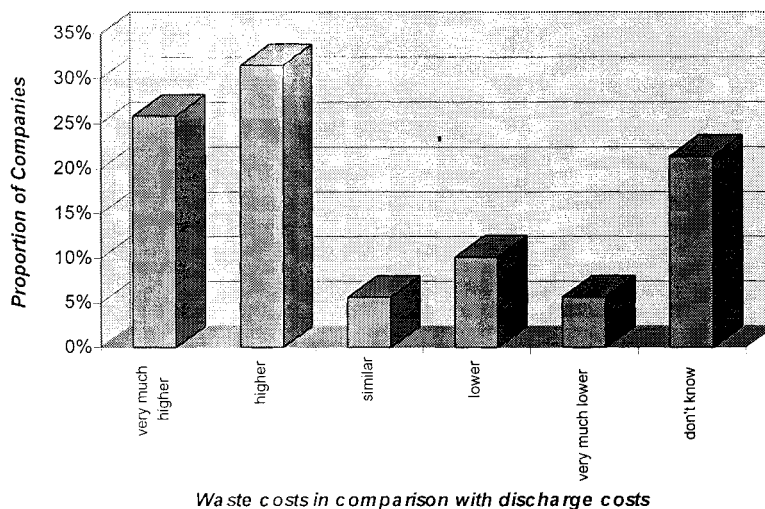


Figure 4.16: Waste Cost Compared To Discharge Charge

In general companies report that energy costs are higher or very much higher than water costs, though a few companies report energy bills to be lower or very much lower.

Companies perceptions are backed up by actual calculations of water cost as a proportion of energy cost. Table 4.20 shows the responses of 32 companies who were able to provide a figure for costs of both water discharge and energy cost. This shows that for the majority of companies water discharge costs are less than 5% of energy costs. No companies reported energy costs higher than water costs.

Table 4.20: Water Discharge Costs As A Proportion Of Energy Costs

Water Cost as Proportion of Energy Cost	Number of Companies
<=0.5%	6
<=1%	7
<=5%	12
<=10%	1
<=50%	6
>50%	0
total	32

Table 4.21: Water Discharge Costs As A Proportion Of Waste Disposal Costs

Water Cost as a Proportion of Waste Disposal Costs	Number of Companies
< 0%	2*
<=0.5%	0
<=1%	2
<=5%	8
<=10%	5
<=50%	5
<=100%	0
>100%	5
total	27

*2 organisations had negative waste costs, in that they could sell process residues

A similar pattern to energy costs emerges when waste disposal costs are assessed. Perceptions of the level of waste disposal costs show that the costs are higher or very much higher than discharge costs. However, a higher proportion of companies report water costs to be similar or much lower.

This result is backed up when actual waste costs are analysed. A smaller sample of 27 companies provided responses, indicating that waste costs are less well known than energy costs (confirming our experience from other work). The spread of water costs as a proportion of waste costs is much greater than with energy costs. 5 companies said their water discharge cost was in excess of their waste cost.

In comparison with waste costs and energy costs the cost of discharge consents appears low. However, the discharge costs refers only to discharge to rivers and does not include and trade effluent charges, or abstraction water supply costs. Therefore, some care needs to be used when interpreting these results. Some companies also mentioned that they would expect water costs to be much lower as the perceived value of the service provided by energy was much more valuable.

4.6.6 Conclusions

The survey found that around half of those interviewed were aware of the cost of consents and the purpose of charging. This outcome confirms earlier findings that consent charges are not an issue for many of those interviewed. Where it was possible to collate costs of consents, in general these costs are a small proportion of most companies turnover and low in relation to waste and energy costs. However, the charges appear to be much more significant to the smallest companies and those in the fish farming sector. The finding that the level of the charge is low, is confirmed by the small financial incentives that companies feel that they have for changing water discharge.

However, the low cost of the consent does not mean that companies perceive the charge to be good value for money. This finding may relate to knowledge of the purpose of the consent and the opinion that the EA provides little in return for the fees. Alternatively this finding may reflect a general attitude that discharges are innocuous and should not be charged for, or concern that if the companies indicated something was cheap, the effect would be for costs to inevitably to rise.

4.7 Behaviour Towards the Charges

4.7.1 Changes to be Made to Discharge

Companies were asked whether they had at any stage changed the nature of their discharge, either in terms of the volumes produced or the substances discharged. The reasons for these changes were noted and interviewees were asked whether they had altered their consent in response to these changes.

Table 4.22: Companies Who Had Changed Nature Of Discharge

Measure	Proportion of Companies Surveyed	Proportion of those making Change who Changed Consents Terms
Reduced Volume	57%	11%
Altered Substance	31%	24%

Over half the survey sample stated that they had reduced volume discharged over the last few years, with a smaller number reporting changes to the substances produced. Some companies

reported that it was impossible to reduce discharges when the consents related to storm water drainage, whilst others had increased volumes discharged. Overall, the survey result would tend to suggest that companies find it easier to reduce the quantity of their discharge rather than its nature. Such a finding could suggest that some kind of 'lock in' to the nature of a company's discharge exists. This could be attributable to the idea that measures taken to alter substances require larger step changes in behaviour (i.e. introduction of new processes or new waste water treatment works). Alternatively, this finding may also illustrate that many of the discharges covered in the survey, are of relatively low hazard (e.g. drainage & cooling water) so changes to load are not really an issue.

4.7.2 Changes Made to Consents

It is also apparent that very low numbers of companies who made changes in their discharge changed their consent to reflect new conditions. Table 4.23 shows that there are a diverse number of reasons companies gave for maintaining the status quo. However, two areas seem to be most important. First many companies perceive there is strategic value in holding on to excess consents, as it provides flexibility and some form of insurance against future uncertainty. Second there appears to be little incentive to change consents. Making changes is perceived as a hassle and expense, with little apparent benefit. It was interesting to see that a number of companies identified the Discharge Consent charge banding system as factor meaning that there was no point in changing the consent, as there would be no financial benefit from doing so.

The factors influencing changes in discharge were examined by asking companies who had altered discharge how important a variety of issues were in influencing that decision. The results are shown in Table 4.24 and Table 4.25.

Tables 4.24 and 4.25 show that in only a small number of the cases where such changes have taken place, that the cost of the discharge consent play any role in influencing companies' decisions to reduce quantity discharged or change the nature of discharge.

The most important reason given as a driver for change appears was internal company policy. This result suggests a departure from other work that ECOTEC has carried out on water use in industry, in which the importance of regulatory pressure in bringing about change has clearly been the prime motivation. Of the other drivers, the survey results suggest that EA pressure is important factor influencing changes in the nature of the discharge. Changes to the quantities discharged are influenced by changes to processes and technologies, EA pressure, and the cost of effluent treatment.

Table 4.23 : Reasons Given For Not Changing Consent

Reason For Not Changing Consent	Number of Companies	
	Changed Quantity Discharged	Changed Load Discharged
Future Expansion	7	3
Did Not Consider It	6	2
Hassle of Changing	4	2
No Point As Still Within Same Quantity Band	4	
Expense in Changing	3	
Value Of Consent, May Not Get Back	2	1
Unconsented At That Time	2	1
Compliance Flexibility	2	
Need Excess For Special Events	2	
Changed With IPC	2	
Don't Know	1	3
Previously In Excess Of Consent	1	3
Not Necessary, New Consent To Start Soon.	1	2
Wanted To Increase Production And Stay Within Consent Limit	1	1
Have Just Made Change, So Have Not Decided Whether to Change Consent	1	
Not Aware How Charging System Worked	1	
Because Did Not Have To	1	
Total	41	18

Table 4.24: Main Drivers In Influencing Changes Quantity Of Water Discharged

	Very Influential	Fairly Influential
EA Charge	9%	11%
Cost of Waste Water Treatment	28%	17%
Environment Agency Pressure	25%	15%
Change in Process or Technology	25%	17%
Company Policy	42%	19%
Competitiveness Pressures	6%	21%
Cost of Other Raw Materials	21%	8%
Other Factors	17%	9%

Table 4.25: Main Drivers In Influencing Changes In Load Of Water Discharged

	very influential	fairly influential
EA Charge	7%	10%
Cost of Waste Water Treatment	14%	10%
Environment Agency Pressure	38%	3%
Change in Process or Technology	14%	17%
Company Policy	34%	7%
Competitiveness Pressures	3%	7%
Cost of Other Raw Materials	3%	3%
Other Factors	17%	0%

4.7.3 Conclusions

From the companies surveyed more than half had changed the quantity of discharge, and a similar number had altered discharge load. Very few people who had changed their discharge, altered their consents. This was mainly due the strategic value of large consents and the perception that there is no reason to change. Also the cost of consent is not important in driving changes in water use, other factors are more important.

4.8 Results of Water Companies Survey

4.8.1 Consent Information

Information concerning consents is given in Table 4.26. The Water Service Companies have a large number of discharge consents ranging in sizes, type and discharge point. One company has 3 large consents which cover the effluent generated by 90% of the population. Those interviewed were in general unfamiliar with the total volume that they were licenced to discharge.

Three of those interviewed commented on the process of rationalising consents. One of these companies admitted before embarking on this process that they had a limited idea as to what all their discharges consisted of from their predominantly Victorian network. Two mentioned that they discovered consents without any discharge, and discharges without consents. The EU Urban Waste Water Treatment Directive was also driving activity in coastal areas. New treatment works coming on stream required new consents and the revocation of those which were redundant.

Table 4.26 : Information Concerning Water Service Company Consents

Number of Consents	Total Licenced Volume	Receiving Water	Content Band	
4000	1600 Ml/day (est)	inland waters 92.6% tidal waters 6.0% coastal waters 0.7% ground waters 0.7%	6 Band A 80 Band B 700 Band C Rest in Band D or above	100 reviewed/applied for each year.
Total 1400 CSOs STWs ? 400 storm overflows & emergency consents 3500 (624 STW, 17 -1800 storm overflows)		99% to sea or estuary. Most to river 30 small discharges to ground. 15 significant discharges to sea. 6 to estuary.	No Band A 10 Band B 95% in Band C Discharges fall into every substance band. 21 List 1 and 2.	
4600 (2500 CSOs, 900 STW)	Don't Know most are in the 100 - 1000m ³ and 1000 to 10,000m ³ bands		3 Band A, (reduces to 2 shortly) Band B, Quite a few Band C are mostly rural discharges.	

4.8.2 Total Consented Volume And Load Discharged

Most of the companies questioned did not know how much in total they were licenced to discharge or how much of consented volume was usually emitted. Headroom varies from season to season and from works to works and consented parameter. Discharge may be fine for BOD and SS but tight on NH₃. Sometimes effluent was stored to allow consent conditions to be met. One company guessed that 80-90% of consented volumes are actually discharged. However, they admitted that flow management at Sewage Treatment Works was far from perfect so this was only a broad brush estimate. Another company had a 'gut feel' that headroom was around 15% on new works and -10% to +15% on older works. One company mentioned that it employed a storage system to ensure the conditions of consents were met.

4.8.3 Costs Of Licences

I) financial payments to the Agency

Figures for the annual charge are given in Table 4.27.

Table 4.27 : Financial Payments To The Agency For Discharge Consents

Annual Charge	As % Turnover
£2.1 million. (£1.6 million for STWs, 500K for storm overflows)	0.6%
£4.8 million. (£3.6 for STW)	0.6%
£3.5 million	0.65%
£4.2 million	0.65%

Three companies mentioned recent-above inflation increases. One had seen costs increase by less than this due to rationalisation of consents. One company is devolving budgets from the group level to local cost centres.

ii) Administrative Costs

As with abstraction charges there are several categories of administrative cost. The first, for administration of the existing consents (ensuring compliance) appears to vary quite considerably between the companies. For one company, this is of the order £6-7,000 per annum. 3 full time equivalents spend just over a third of their time processing consents. Another has one full-time equivalent checking that they are being charged the correct amount (they are able to claim back that where they have not used emergency sources. another company has automated its system and employs only one full time equivalent for 10% of the time.

Again, there is variation in the labour employed to revise and apply for consents. One and a half full-time equivalents of consultancy time are employed on applications in one firm. In another, five people are employed full time. A third company commented that applications can cost between £300,000 and £5 million in any given year. Each new application costs at least £500 and up to £5000.

The last area associated with administering consents are consultancy services for Environmental Impact Assessment related to new applications. One company noted that recent coastal applications had led to their spending more than £250,000 on such assessments.

4.8.4 Experience Of Dealing With E.A.

To some extent, the comments from companies echo those made by personnel dealing with abstraction (and the comments above concerning the costs of applying for new consents). In general, the Agency are helpful in administering the scheme, and companies have 'hard, but

fair' debates with Agency personnel (one company felt that these debates were too hard on the Agency side). The different companies had different experiences in terms of the time taken to process consent applications. In one area, the Agency often took at least 6 months to determine applications, in another area, the Agency were deemed to be 'pretty good' at dealing with matters within the four month period. One company which experienced delays in replies to queries on charges said these sometimes cause unnecessary work, and when prompted for a 'guesstimate' as to the cost implied by this delay, the respondent reckoned the figure was of the order £2-3,000 per annum.

One company felt strongly that the EA gets water companies to pay for research that they should not have to. Why, it asked, is the water industry paying for meeting an EQS for pesticides? Why does this cost not fall to the agrochemicals industry?

Another company does not find that the Agency is particularly responsive when it comes to dealing with requests from them for an explanation of their billing. The Agency has found it impossible to break down bills in terms of STW discharges, Water Works Discharges/Trade Effluent, and CSOs. It is particularly disappointing to this company that what is a multi-million pound bill cannot be explained better.

4.8.5 Perception Of The Level Of Charges

Only one company felt that the charge level was particularly high, referring to it as 'a significant cost.' However, this answer has to be contextualised. They are a small fraction of total turnover and when asked what fraction of the costs of the service provided were accounted for by charges, the respondent did not know (referring us to OFWAT publications). For this company, it is apparent that the Directors of the company see the consent costs as a 'controllable cost' under which it is assumed that there is scope for (efficiency) savings from year to year. He clearly feels this is an unrealistic position. He is under pressure to deliver these savings, when in fact the costs are not really under the company's control (or less so than the Directors perceive).

One of the other companies saw the charge as fair, comparing it with the £300 million being spent on new treatment plant. Another saw the charges as nothing more than a tax. Again, they pointed out that the cost of providing extra treatment is far higher than paying the charge. The fourth company said they had little to compare the charges with.

Three companies were concerned that they were not receiving value for money. One company mentioned that some of its sites receive very little service. Another said that charges were levied for organics and metals in discharges but no monitoring of these took place. The third would like to see how the money paid is spent, and would appreciate some explanation via a statement of the type found in council tax bills.

Some companies pointed towards the likelihood of increased costs to them if they are required to carry out more of the monitoring work themselves, and one company referred to

implementation of EC Directives, such as the Discharge of Dangerous Substances to Water, which could have quite major cost implication.

4.8.6 Incentive Effect Of Current Charges

All companies felt that, for the most part, the charging system had no incentive effect. One company was of the view that the charge would have to be ten times its current level to have any sort of incentive effect as an economic instrument. There appear, therefore, to be no locational effects, and no incentives to tailor consents to levels of need (they are always over-specified at the time of application, one company saying that typically ten years' future capacity was planned into the consent). Obsolete consents cost £600 to change, but changes are costless if they are asked for by the Agency, so companies tend just to leave them.

The only aspect of the charge system which affects companies an their investment (and charging) decisions is the banding according to substance. As one company put it, the 'factor 14' charge applied to Red List substances does concentrate the mind somewhat. There is an incentive, therefore, to ensure that such substances do not appear in the terms of the consent. The marginal cost of this can be large, so the aim is to pass this back to those responsible for the discharge of the substance concerned. This led to a variety of comments, one company stating that if it did this, small operators would be put out of business, another stating that the prohibitive cost had effectively prevented a builder from pumping water from a contaminated site to STW so as to lower the water table for construction purposes.

4.8.7 Opinions Concerning Current Charging System

One company felt that the current system is easy to understand and easy to administer, another saw the charges as simply having to be paid. This latter company, as well as one other, felt that there should be a mechanism for charging for pollutant loads. The mere presence of a substance determines the charge band with no weighting for load. Similarly, there is concern that the charge is related to what the Agency puts in the consent terms, not what is actually discharged.

Two companies felt there should be clear indications in advance of how the charges will change from year to year. One was concerned with the impact on other areas of his budget, which is fixed in advance of this announcement, but within which consent charges are included. The other had similar concerns regarding planning. They usually hear in February about changes to be made in April. They would like to hear in the Autumn.

Lastly, one company was puzzled as to why the current size bands stop at 150K. This is equivalent to a catchment of around 1 million people. This would mean that consents for Thames Water in Becton, London, serving 4-5 million, would cost the same as consents serving much smaller catchment areas.

4.8.8 Attitude Toward Incentive Based Charging Scheme

Most companies viewed positively a charging system that was more closely allied with the polluter pays principle. It is clear that for each of the companies, in some case they probably discharge more than they are licensed to, in others less.

One company said that, currently there are cases where they could fit GAC on STW but the capital costs are currently too large to justify the investment. Higher charges for consents could make a difference to the financial calculus. A difficulty relates to how one would pass costs back to those discharging the substances making such investments necessary / worthwhile. Those (few) companies would be driven out of business if they, specifically, were asked to pay the costs.

Two companies would welcome a quantity and load based charging system. Both expressed concern that this would be simply a means to increase the level of charge 'by the back door.' One company saw few problems with transferring flow and load information to the Agency. However, another company's response was that a load-based charging system could be a nightmare to administer, involving a great deal of monitoring.

4.8.9 Management Of Consents (Distribution Of Responsibilities)

Typically, all issues to do with consents are managed by one department. There is one exception where compliance and the financial side are localised functions, but applications for new consents are centralised tasks. Financial pressures to which the total cost of licences are subject would appear to vary between companies depending on the way budgets are set for the responsible department.

4.8.10 Comments

The views of water companies concerning consents suggest that there is only one aspect of the charging scheme that conveys a significant incentive to them. This is the banded nature of the charge system which penalises the companies where certain materials are present in their discharge. They are not generally opposed to a polluter pays type system, but they would like to feel they have leeway to pass through costs. One company was concerned that the information requirements would be burdensome (though two others opposed this view).

These comments differ only slightly from those of the other companies. there, a lack of awareness of the banded nature of the charging scheme prevented any incentive effect being conveyed (even where such changes were technically possible) through this means.

5.0 CONCLUSIONS

5.1 Abstraction Licences : Other Industrial Sectors

□ Environmental Awareness

A third of the companies interviewed are members of some form of environmental management scheme (EMS). A quarter (mainly but not all those with an EMS) produce environmental reports. Typically, the responsibility for licences lies in the hands of one person (75% of sample), though this is less likely in medium-sized firms in our survey (100-500 employees, where the figure is 53%). Budgets for abstraction costs tend not to be set separately and are usually lumped together within general company expenditure, this being the case for 59% of the sample. Two thirds (64%) of the sample do not review their abstraction costs, although the majority (58%) of the sample were able to supply a figure for these costs.

□ Effects of the Charging Scheme

To the extent that one can characterise the enterprises surveyed in such a way, we have characterised them as good or bad performers on the basis of whether or not they review their licence costs, and whether they have reduced water use in the past. Forty percent (50) of the companies surveyed in the 'other industrial sectors' both do not review costs and have not reduced water use, and might be tagged as 'poor performers'. Of these, 37 (74%) companies set their budgets as part of a total company budget and 42 (84%) do not belong to an environmental management scheme (as compared with 80 in the total sample).

Twenty percent (25) of companies surveyed in the 'other industrial sectors' both review costs and have reduced water use, and might be tagged as 'good performers'. Of these only 7 (28%) set their budgets as part of the total company budget and 12 (48%) do not belong to a form of environmental management scheme. It would appear that those companies for whom the costs of water abstraction have to be met from more narrowly defined budgets are likely to be more aware of costs and are more likely to change behaviour as a result of any incentive effect from charging (however small).

The fact that so few companies review costs is consistent with the facts that :

- i) abstraction licences are not deemed to be particularly expensive;
- ii) abstraction licences are widely recognised as being assets to the holders; and
- iii) the current abstraction licencing system does provides only very limited motivation for companies to reduce their use of water, or to change the terms of their consents.

These points are not so much separate issues but part of a related whole. Evidence for each of these points is provided in the study, and summarised below.

i) Cost Of Licences

A number of companies (19% of sample) responded to the question concerning the level at which abstraction charges were set by saying that they were either high or fairly high. However, 43% thought they were low or fairly low, and 34% thought they were set at about the right level. We believe that these views relate to what it is that licence holders feel they are paying for. A large number of companies who were able to give an answer to this question (around 60%) responded in a manner which was partially, or completely correct. There is good reason to believe that responses, therefore, were shaped by this perception. A number of interviewees felt that they were not in receipt of a service which warranted the payment they were making.

This was a point made explicitly by one or two respondents when asked to compare the costs of water abstraction licences with the costs of waste disposal and of energy. The quality of the service provided was, they argued, not as high. It is difficult to make absolute judgements as to what magnitude of figure constitutes a high or low percentage of total turnover for water abstraction charges. Typically, this lies in the region of 0.05% but there is wide variation between enterprises. Small (by turnover) enterprises appear to pay more by this measure than larger companies. By sector, farmers are the highest charge payers by this measure (0.23%) and food and drink companies pay least (0.018%), a difference of a factor of more than ten. The comparison of licence costs with those of energy and waste disposal indicate that these are, respectively, typically much less, and less than licence costs.

ii) Asset Value Of Licences

Three quarters (76%) of licence holders interviewed were of the view that their licence was an asset to them. This value arises in different contexts, and the most widely stated reason was that the licence is vital for production purposes. Of those who thought such a value existed, 16% recognised the value of the licence attached to their land. A large number saw the licence's value in the fact that it did not necessitate use of alternatives.

iii) Minimal Incentives

Only a fraction of those companies who had undertaken measures to reduce water use were of the view that abstraction charging had any effect on their decisions to do so. Much more important were the effects of changes in processes and technologies designed to achieve other ends, but which also achieved water use reductions, and companies' concerns to give their business room to grow in an environment where they felt unsure of obtaining increases to their existing licences. Of those companies that undertook such reductions, only three changed their licences as a result, confirming the strong perception of licences as an asset.

All companies were asked what incentive they thought was provided by the existing charge scheme. Two thirds (67%) of respondents replied that there was no incentive whilst a further 12% were of the view that the incentive was so small as to be insignificant. Only 8% saw the charge as highly significant. Ironically, these companies were principally from the food and

drink sector, the sector for which abstraction charges expressed as a percentage of turnover were lowest in our survey.

Overall, it seems clear that the current charging system provides limited financial incentives for enterprises to undertake reductions in water use. Several enterprises treat the licence as a fixed cost, and there would appear to be a feeling among some respondents that water should not be paid for at all.

5.2 Abstraction Licences : Water Companies

To some extent, the responses of the water companies reinforce the findings from the other industrial sectors. Abstraction charging provides minimal incentives for changes in the level of water use. The costs of reducing demand through demand management measures appears to outweigh the costs of developing new resources, at the current level at which water abstraction is charged.

Water companies were not unfavourably disposed to unit charging schemes provided they were allowed to pass on the charge to consumers. Questions were raised, however, concerning the rationale behind the regional variation in abstraction charges. To the extent that some saw the current cost recovery rationale as a small disincentive to undertake reductions in water use (the Agency would simply increase the SUC to recover the same revenue), a unit based charging which was intended to account for environmental costs, or which was intended to generate reductions in use, might be welcomed. On the other hand, enterprises in regions with lower SUCs might not be so ready to accept such a change.

Companies expressed concern regarding the value for money they were receiving from the Agency, and they would like better information on how money is spent. They were also of the view that the delays in processing applications for new licences, and changes to existing ones, were unacceptable.

5.3 Recommendations

The system of abstraction licence charging is currently having a minimal impact on companies' decisions to reduce water use. The incentive is simply not strong enough. Yet this is not what charging for abstraction licences was designed to do. They were designed as a mechanism for cost recovery. Many enterprises are aware of this and their perception of the level of charges is shaped by this knowledge.

Even if abstraction costs are successful in their cost recovery role, the survey raises questions as to whether the current level of regulation is sufficient to deter water users from breaching the terms of their licence. At least four companies were in breach of the terms of their licence.

There are good reasons to support an incentive based charging mechanism designed to encourage more efficient use of water, and certainly, the scope for increases in the charge as a means of achieving this end is quite significant (or so the survey suggests). The design of such

a scheme would, however, have to be undertaken with great care. Furthermore, to the extent that companies are currently aware of the objectives of the existing scheme, it would be important to spell out the objectives of any changes. It would also be important for companies to see what was happening to any revenue raised were it the case that it was not introduced as an unhypothecated tax.

The current system of licencing has the advantage that it provides enterprises with some knowledge of security of supply, notwithstanding any measures which are the result of exceptionally dry years. It would be desirable if any unit based charging mechanism could retain some aspect of this system such that it gives some (not necessarily the same) security of supply, whilst at the same time giving enterprises a greater incentive to reduce excessive capacity in their licences, thus ensuring (hopefully) a more rational distribution of the water resource.

The two-part tariff used for spray irrigators might be regarded as a starting point for discussion in this regard, but it seems that this might not assist in the aim of bringing licenced volumes into line with volumes actually used. It might be worth considering a three part tariff, where a small fee is put in place for 'unutilised resources'. This could be paid per unit, or on a scale which rises with the level of underutilisation, and would aim to reduce the extent to which the licenced abstraction volume deviates from the volume actually utilised.

A positive spin-off of any incentive-based charging mechanism might be that the quality of available information concerning water use increases. The information is not exactly as one might hope at present. A charging scheme based on quantities used might help, as in the Landfill Tax case, in the generation of improved data.

5.4 Discharge Consents : Other Industrial Sectors

□ Understanding of the Current System of Charging for Discharge

The survey showed that there was limited understanding of the current system of charging for discharge consents. The most striking outcome was the low level of knowledge concerning the substance banding system used to classify different types of discharges. Only 12% of those questioned were sure of the band that their discharge was classified in. Another interesting outcome, was the limited number of companies who were able to specify (even approximately) the cost of their consent. Some 44% of those surveyed were unable to provide any details of what they paid. This poor knowledge extended to the reason for levying the charge. Around half of those questioned (48%) were aware of the true purpose of the charges.

□ Effects and Impacts of the Current Regime

Given the limited awareness and understanding of the current regime, it is not surprising to find that the charge has a limited impact on behaviour (although one could argue that the direction of causality lies in the opposite direction). Just 25% of those surveyed perceived that the charge provided a financial incentive for altering discharges. In addition of those

companies who had actually undertaken measures to alter their discharge, only 20% who changed quantity and 17% quality of discharge cited the charges for discharge consents as an influential factor in their decision making.

The limited incentive effect provided by the charge is illustrated by the small proportion of turnover that the charge constitutes for most companies. It was found to be typically be under 0.05% of most companies' turnover. However, there are distributional effects to the charges. For example, the current system appears to impact disproportionately upon small companies as charges make up a much larger proportion of their turnover (around 1%) when compared to larger firms.

Comparison of the discharge costs with those for energy and solid waste disposal confirmed the relatively low cost of discharge. Discharge costs were typically below 5% of energy costs and up to 50% of waste costs. These results need to be interpreted with a certain amount of caution, given the limited knowledge that most people generally had about their costs. The lack of importance of the charge to many companies is reinforced by the finding that 51% of companies never review their costs of discharge.

□ Companies' Ability to Respond to Changes

Despite the fact that awareness of the current system and incentives for altering discharges are low, it also seems that companies potentially have the capacity to respond to changes. For example, the general level of environmental awareness within companies was fairly high, 55% having some form of environmental initiative. This would imply that a fair proportion of those questioned would be conducive to change or understand when change was desirable.

Further evidence that companies may be responsive to changes in the consent system can be seen by the way in which certain companies operate. As with abstraction licences above, to the extent that one can characterise the enterprises surveyed in such a way, we have characterised them as good or bad performers on the basis of whether or not they review their consent costs, and whether they have reduced discharges in the past. It was found that a third (30 out of the 93) of companies both reviewed the costs of discharge consents, and had taken measures to alter water discharge. Of these 'good performers' only 27% budgeted for consents as part of overall expenditure and a similar number (27%) had no form of environmental initiative. Conversely a group of "poor performers" could also be identified. Almost a third of (27 out of the 93) companies did not review costs and had not taken measures to alter discharges. Of these companies almost 48% set budgets as part of total expenditure and 56% were not part of any environmental initiative.

□ Potential Impact of Changes in Charges

The ability of management to respond to changes must be backed up by the technical feasibility of changing discharges. The conclusion that many companies appear to have the management capability must be qualified by the finding that many companies feel that their discharges are fixed or beyond their control. For example 53% have discharges wholly or

partly relating to drainage or aquaculture. Some users of water questioned the rationale for charging for discharges of water that were cleaner than that originally taken from the water course. Others stated that the EA encouraged them to discharge in order to supplement river flows or dilute nearby contamination. Any change in the incentives to discharge would need to take into consideration such situations and avoid potentially encouraging environmentally damaging behaviour.

Higher charges may have the effect of altering discharges of some companies. 40% of those who had considered changing their discharge habits found that the cost of alternatives was the biggest inhibitor of change. Increases in the relative cost of discharge consents will have the effect of shifting the balance in favour of alternatives. However levels of support for increasing charges are low. Just 13% saw current charge levels as low or very low. One reason for this is that many of those aware of the real purpose of the charge did not perceive that they were getting value for money from the EA. It would appear that higher charges will not be popular unless service levels increase and more explanation is given of how the charge is spent.

5.5 Discharge Consents : Water Companies

The water companies expressed many sentiments that were similar to those held by the other companies surveyed. They expressed no strong opinions as to the level of the charge, but did question some aspects of how it was operated. For example there was some concern about the justification for above inflation increases in the charges, and the short notice with which increases were announced. In combination, these factors made it difficult to make firm financial plans for the future. A few companies questioned whether they were receiving value for money in terms of the level of monitoring service that they were receiving from the Agency and mentioned the length of time some consent applications/variations took to determine. Another found the Agency's billing information to be of limited value.

All companies agreed that the current charging system provided no incentive effect on the nature of the discharge. The one exception was the "Factor 14" charge multiplier, which applies on the most dangerous substances. This creates incentives for companies to ensure that their treatment works discharges do not attract such a weighting. One company questioned the selection of the upper limit for the quantity banding factor and the fact that it benefited companies with very large works.

There was a mixed reaction to the idea of a unit based charging system. Some companies were supportive, whilst others perceived that it would be used as a way to increase the overall burden of the charge and could be complex to administer.

5.6 Recommendations

In a similar way to abstraction licences, the system of charging for discharge consents is having very little impact on the way in which companies discharge water. This result may be unsurprising given that the purpose of the regime is administrative cost recovery. Even on this basis, it is not clear whether the system has been effective. Many of those aware of the purpose of the charge are failing to see the link between the fee that they pay and the activities that it funds. Greater clarity and communication between the Agency and dischargers on the spending of such fees may be helpful, as would a more visible presence in carrying out the activities the charge is supposed to fund. One suggestion of a Council Tax style annual statement itemising how the charge is spent may be a useful development.

Any move to an incentive based system would need to be carefully thought through. Attention needs to be given to the desirability and practicality of altering current discharge patterns, by making reference to the quality of the discharge and the needs of the receiving water. Distributional effects on smallest companies should also be considered as they appear to be most exposed to current means of charging. Any increase in the incentive level would also require a change in justification for the charge if it were to be widely accepted. This means that the objective of cost recovery would need to be altered to include wider aims of reducing pollution.

5.7 Suggestions for Further Research

This research has provided some insight into the way in which different enterprises treat and perceive the charges for abstraction licences and discharge consents. It has not shed any light onto how this affects the dynamic response from companies in the wake of changes in the charging system. To the extent that moves to a more incentive-based scheme may be under consideration, the study serves as a valuable baseline upon which to base any further research into the responses that such a change might engender. In the interests of an evaluation of the effects of any such change, a follow-up study would be useful if such a change occurred in the near future.