

The Environmental Protection
Agency
- 1 JUN 2007
CORK

URBAN WASTE WATER TREATMENT DIRECTIVE (91/271/EEC)

Procedures and Criteria
in relation to
Storm Water Overflows

DIRECTOR-GENERAL'S
OFFICE
6 MAR 1995



DEPARTMENT OF THE
ENVIRONMENT

THE UNIVERSITY OF CHICAGO
DEPARTMENT OF CHEMISTRY
5408 S. UNIVERSITY AVENUE
CHICAGO, ILLINOIS 60637

PROFESSOR J. H. GOLDSTEIN
DEPARTMENT OF CHEMISTRY
UNIVERSITY OF CHICAGO

RECEIVED
JAN 15 1964

Contents

	Page
1. Introduction	1
2. Directive's Requirements	2
3. Quality Standards	
3.1 General	3
3.2 Bathing Waters	4
3.3 Sensitive Areas	6
4. Assessment Criteria for Existing SWO's	6
5. Options following Assessment	7
6. Upgrading SWO's/New SWO's	
6.1 Design Criteria	7
6.2 Design Principles	8
6.3 Detailed Design Requirements	11
6.4 Planning Methodologies	13
7. Use of Storage	13
8. Active Control	15
9. Catchment Management	16
Appendix 1	
Appendix 2	
References	



Storm Water Overflows

1. Introduction

The Urban Waste Water Treatment Directive 91/271/EEC (UWWTD) which came into effect on 30 June, 1993 provides a framework for action to deal with the pollution threat from urban and industrial waste water. In relation to urban waste water, specific requirements apply to the provision of collecting systems and treatment plants and Member States must also decide on measures to limit the pollution from storm water overflows. This paper is intended to assist local authorities and their consulting engineers in the evaluation of requirements for implementation of the latter aspect of the UWWTD. In particular, the paper indicates the general approach and the design criteria to be followed and discusses the way these criteria might be implemented.

The overall approach is to ensure that the efficiency of the collecting system is considered in addition to the efficiency of the ultimate treatment process. In this way, the overall performance of the sewerage system is defined rather than that of the treatment plant only.

The European Commission has commissioned a consultant to carry out a review study of stormwater pollution control systems used in EU Member States. The purpose of the study is to do a comparative analysis of current practices in terms of environmental benefit and economic consequences, to develop general and technical guidelines and recommendations for good practice which can be adopted by waste water operators, and to propose suitable variants to the general guidelines to meet local needs where appropriate. The criteria and guidelines set out in this paper will be reviewed in due course in the light of any recommendations of the study report which is due to be completed shortly.



The first part of the document discusses the importance of maintaining accurate records. It emphasizes that proper record-keeping is essential for ensuring the integrity and reliability of the data collected. This section also outlines the various methods used to collect and analyze the data, highlighting the challenges faced during the process.

The second part of the document focuses on the results of the study. It presents a detailed analysis of the data, showing the trends and patterns observed. The findings indicate that there is a significant correlation between the variables studied, which supports the hypothesis of the research. This section also includes a discussion of the limitations of the study and suggestions for future research.

The final part of the document provides a conclusion and summarizes the key findings. It reiterates the importance of the research and the need for further investigation in this area. The document concludes by expressing the hope that the findings will be useful to other researchers and practitioners in the field.



2. Directive's Requirements

Article 3 of the Directive requires Member States to "ensure that all agglomerations are provided with collecting systems for urban waste water,

- at the latest by 31 December, 1998 for those with a population equivalent of more than 10,000 discharging into a sensitive area
- at the latest by 31 December, 2000 for those with a population equivalent (p.e.) of more than 15,000, and
- at the latest by 31 December, 2005 for those with a population equivalent of between 2,000 and 15,000.

It further requires that collecting systems satisfy the requirements of Annex 1(A) of the Directive which stipulates that

"The design, construction and maintenance of collecting systems shall be undertaken in accordance with the best technical knowledge not entailing excessive costs, notably regarding:

- volume and characteristics of urban waste water,
- prevention of leaks,
- the limitation of pollution of receiving waters due to storm water overflows."

In a footnote to the above requirements, the Directive recognises that it is not possible in practice to construct collecting systems and treatment plants in a way such that all waste water can be treated during situations such as unusually heavy rainfall. As a result, it requires Member States to decide on measures to limit pollution from storm water overflows and suggests that such measures:-

74

60

4

0

4

0

16

12

4

12

4

16

16

16



(1) could be based on

- dilution rates, or
- capacity in relation to dry weather flow, or

(2) could specify a certain acceptable number of overflows per year.

3. Quality Standards

3.1 General

Apart from the specific requirements of the UWWTD, certain quality standards or objectives for the aquatic environment must be considered in relation to the provision of upgraded or new storm water overflows. These comprise standards in the following European Union Directives:-

- Council Directive of 8 December 1975 concerning the quality of bathing water (76/160/EEC)
- Council Directive of 18 July 1978 on the quality of fresh waters needing protection or improvement in order to support fish life (78/659/EEC)
- Council Directive of 30 October 1979 on the quality required of shellfish waters (79/923/EEC)
- Council Directive of 16 June 1975 concerning the quality required of surface water intended for the abstraction of drinking water in Member States (75/440/EEC)

These standards have been given legal effect in Ireland in each case by means of the following national Regulations:-

- S.I. No. 155 of 1992 Quality of Bathing Water Regulations, 1992 and S.I. No. 145 of 1994 Quality of Bathing Waters (Amendment) Regulations, 1994;

- S.I. No. 293 of 1988 European Communities (Quality of Salmonid Waters) Regulations, 1988;
- S.I. No. 200 of 1994 Quality of Shellfish Water Regulations, 1994;
- S.I. No. 294 of 1989 European Communities (Quality of surface water intended for the abstraction of drinking waters) Regulations, 1989.

These Regulations generally require compliance with the imperative (I) standards prescribed but, in the case of bathing waters, it should be noted that the guide values therein must be the aim, since it is adherence to the guide values (and not the mandatory I values) which enables areas to qualify for Blue Flag status.

Apart from the need to ensure that the standards set in Regulations are complied with, sanitary authorities must also consider standards (or objectives) set down in Water Quality Management Plans as well as the standards/objectives recommended by the Technical Committee on Effluent and Water Quality Standards in its "Memorandum No 1 : Water Quality Guidelines (1979 Report)". Information Note: In regard to the latter Memorandum, the Department is at present considering the making of regulations under Section 26 of the Water Pollution Act 1977 setting quality standards in regard to waters generally for a range of List II Dangerous Substances pertinent to the Irish situation.

3.2 Bathing Waters

As regards the protection of bathing waters, restricted spill frequency and volume of storm water discharged is required during the bathing season from mid-May to August.



The use of Time Series Rainfall for storm events confined to these months allows the determination of frequency and volume of spill using the calibrated hydraulic model of the network. Iterative use of the model with a variety of storage volumes will determine the solution to satisfy the limits adopted.

The National Rivers Authority (NRA) in the UK has set out standards for consenting storm water overflows into or in close proximity to bathing areas and water contact/recreational use waters and these standards can be summarised as follows:

- The maximum number of independent storm events discharged via the SWO must not, on average, exceed 3 per bathing season for identified bathing waters unless it can be shown that the design will achieve the water quality standards of the Bathing Water Directive for at least 98.2% of the time.
- The maximum number of independent storm events discharging via storm water overflows affecting water contact/recreational use waters must not, on average, exceed 7 times per bathing season.
- The soffit level of the overflow outfall must be located below the level of the low water mark of mean spring tides (MLWS); otherwise a spill frequency criterion of 1 spill in 5 bathing seasons will apply.
- Normally the incoming flow must exceed that calculated from "Formula A¹" before the storm water overflow spills unless there are high dilutions available.
- Discharge flows are required to be screened to at least 10mm and where the frequency of spill is greater than once per year, 80% of the volume should be screened to at least 6mm.



The first part of the document discusses the importance of maintaining accurate records of all transactions. It emphasizes that every entry should be supported by a valid receipt or invoice. This ensures transparency and allows for easy verification of the data.

In addition, it is crucial to review the records regularly to identify any discrepancies or errors. This proactive approach helps in resolving issues before they become significant problems. The document also mentions the use of digital tools to streamline the record-keeping process.

Furthermore, the document highlights the need for secure storage of these records. Whether physical or digital, the information must be protected from unauthorized access and loss. Regular backups and secure deletion policies are recommended to ensure data integrity and confidentiality.

The second section of the document focuses on the importance of clear communication within the organization. It states that all team members should be kept informed about the progress of projects and any changes in direction. Regular meetings and reports are essential for maintaining alignment and accountability.

Moreover, the document stresses the value of listening to feedback from all levels of the organization. Encouraging open dialogue allows for the identification of areas for improvement and the implementation of effective solutions. This collaborative approach is key to achieving long-term success.

Finally, the document concludes by reiterating the importance of staying organized and up-to-date. Consistent record-keeping and communication are the foundation of a successful business operation. By following these guidelines, organizations can ensure they are well-prepared for any challenges that may arise.



Network models using the WALLRUS software package can be used to establish the storage volume requirements to meet the criteria for potential SWO spills to the identified bathing waters.

The type of screen used to achieve the requirements should be of the screenings retention type and not of the removal type. That is, the screenings intercepted by the screen should be retained in the sewer system and not removed for separate disposal. This will reduce running and maintenance costs of screening at storm water overflows.

3.3 Sensitive Areas

The requirements for effluent treatment prior to discharge to sensitive areas is for a minimum percentage reduction of 80% of total phosphorus and 70-80% of total nitrogen. It would appear reasonable that a volume reduction in storm sewage spill of this magnitude would be a consistent standard in this area. That is, the volume overflows as a percentage of rainfall run-off volume to the foul sewer would be a maximum of 20%.

This will require that a combination of storage and other sewerage improvements be considered to contain 80% of storm water run-off using Time Series Rainfall analysis in the Wallrus models for the contributing catchments. This level of containment (80%) would be a minimum value and should correspond to a proportionately higher percentage containment of nutrients since part of the nutrient load is carried in suspended solids, retention of which would be maximised in the design of the overflow structures.

4. Assessment Criteria for Existing SWO's

In assessing the operation of an existing SWO, one must determine if it:

- (1) causes significant visual or aesthetic impact and public complaints,

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60
61
62
63
64
65
66
67
68
69
70
71
72
73
74
75
76
77
78
79
80
81
82
83
84
85
86
87
88
89
90
91
92
93
94
95
96
97
98
99
100

101
102
103
104
105
106
107
108
109
110
111
112
113
114
115
116
117
118
119
120
121
122
123
124
125
126
127
128
129
130
131
132
133
134
135
136
137
138
139
140
141
142
143
144
145
146
147
148
149
150
151
152
153
154
155
156
157
158
159
160
161
162
163
164
165
166
167
168
169
170
171
172
173
174
175
176
177
178
179
180
181
182
183
184
185
186
187
188
189
190
191
192
193
194
195
196
197
198
199
200

201
202
203
204
205
206
207
208
209
210
211
212
213
214
215
216
217
218
219
220
221
222
223
224
225
226
227
228
229
230
231
232
233
234
235
236
237
238
239
240
241
242
243
244
245
246
247
248
249
250
251
252
253
254
255
256
257
258
259
260
261
262
263
264
265
266
267
268
269
270
271
272
273
274
275
276
277
278
279
280
281
282
283
284
285
286
287
288
289
290
291
292
293
294
295
296
297
298
299
300

- (2) causes deterioration in water quality in the receiving water,
- (3) gives rise to failure in meeting the requirements of national Regulations on foot of EU Directives (Bathing Waters, etc.)
- (4) operates in dry weather.

5. Options following Assessment

Following assessment of an SWO on the basis of the criteria set out above, there are a number of options which can be considered in the context of remedying any capacity constraints. The first and most widely used option is an upgrading of the existing system. As the design considerations associated with upgrading also apply to new SWO's, these are dealt with together in section 6 below. Other options are "use of storage" and "active control". The use of storm water storage tanks is increasingly recommended as an alternative to the up-sizing of downstream capacity and this is dealt with in section 7 below. Active control, which involves effective use of spare storage capacity of sewer networks, is a relatively new approach and is dealt with in section 8 below.

6. Upgrading SWO's/New SWO's

6.1 Design Criteria

The general criterion for the future design of storm water overflows is defined as an absence of visible signs of sewage-derived debris (e.g. oil slicks, foaming etc.) and of deposits or algal growths caused by sewage discharge. This requires that the effects of organic/nutrient loads deposited in bed sediments must also be considered.

1998

1999

2000

2001

2002

2003

2004

2005

2006

2007

2008

2009

2010

2011

Design criteria for storm water overflows must take into consideration the following:

- beneficial uses of receiving waters and corresponding standards and water quality objectives,
- the nature and strength of sewage including the effects of re-suspension and "first foul flush" effects which may increase rather than diminish sewage strength in the sewer with increasing flow, and policy in relation to industrial discharges to the sewer,
- the siting of overflow discharges and their potential for aesthetic nuisance, and
- the type of overflow and its efficiency in containing as far as possible floating debris and solids generally, i.e. maximum solids separation.

6.2 Design Principles

The main difficulty in relation to setting standards for storm water overflows is the lack of information available on the effects of transient shock loadings on the receiving water and the difficulty of predicting their effects. Random physico-chemical sampling may not identify pollution associated with overflows. Biological sampling and assessment of receiving waters and bed sediments provides a more accurate assessment of on-going environmental conditions. Such sampling will be expected to indicate the biological impact of transient pollution.

The minimum setting for storm water overflows has traditionally been six times dry weather flow (6 DWF). In the UK this approach was replaced by "Formula A" following the report of the Technical



The first part of the report deals with the general situation of the country and the progress of the work done during the year. It is followed by a detailed account of the various projects undertaken and the results achieved. The report concludes with a summary of the work done and a list of the publications issued during the year.

The second part of the report deals with the financial position of the institution. It gives a detailed account of the income and expenditure for the year and shows how the various projects have been financed. It also gives a list of the assets and liabilities of the institution at the end of the year.

The third part of the report deals with the personnel of the institution. It gives a list of the staff members and their duties and also a list of the students who have been admitted during the year. It also gives a list of the members of the various committees and their work.

The fourth part of the report deals with the publications issued during the year. It gives a list of the books, pamphlets, and other publications issued and also a list of the authors and editors. It also gives a list of the titles of the articles and papers published in the various journals and magazines.

The fifth part of the report deals with the general work of the institution. It gives a list of the various committees and their work and also a list of the various projects undertaken. It also gives a list of the various conferences and meetings held during the year.

Committee on Storm Overflows and the Disposal of Storm Sewage (HMSO 1970)¹.

This is defined as follows:

$$\text{Formula A} = \text{DWF} + 1.36P + 2E \text{ m}^3/\text{day}$$

where 'P' is the population served and 'E' is the industrial effluent flow.

This provides broadly for 6 DWF from the domestic contribution but uses only a factor of 2 on the industrial effluent flow. This appears very low particularly where industrial effluent comprises a significant proportion of the total flow and constitutes high strength wastes with potentially toxic impacts. This was recognised in the report with a recommendation to increase the term '2E' in such situations.

Formula A should be considered as the minimum overflow setting in all situations whilst, at the same time, recognising its limitations in that

- no account is taken of the impermeable area draining to the overflow,
- no account is taken of the flow regime or use of the receiving water,
- there is no set method for making allowances for industrial discharges,
- no account is taken of the impact of intermittent pollution on the quality of the receiving water.

In addition, the following steps should also be applied:

- (i) subjective criteria should be applied to exclude spills to minor watercourses and small, relatively clean, streams and such receiving waters should be deemed unsuitable for such discharges,
- (ii) storm overflow structures should be designed in accordance with the WRC publication ER304E² with acceptable types of overflow structure limited to high side weir, stilling basin and vortex chamber overflows designed to achieve efficient solids separation and retention,
- (iii) outlet control should maximise the retained flow at a near constant rate within the system capacity,
- (iv) such an overflow should be designed for effective containment of detritus and floating debris,
- (v) overflow structures should be capable of being properly maintained with provision for adequate ventilation, safe access and lighting,
- (vi) overflow discharge points should be discreetly located and for, coastal outfalls, should be taken, where practical, to low water level,
- (vii) traditional structures of the low side weir type and ad-hoc overflows of the hole-in-the-wall type should in time be replaced by properly designed overflows, rationalised where possible to a minimum number of overflow structures for each system.

1. The first part of the document discusses the importance of maintaining accurate records of all transactions and activities. It emphasizes that this is essential for ensuring transparency and accountability in the organization's operations.

2. The second part of the document outlines the various methods and tools used to collect and analyze data. It highlights the need for consistent and reliable data collection processes to support informed decision-making.

3. The third part of the document focuses on the role of technology in modern data management. It discusses how advanced software solutions can streamline data collection, storage, and analysis, thereby improving efficiency and accuracy.

4. The fourth part of the document addresses the challenges associated with data security and privacy. It stresses the importance of implementing robust security measures to protect sensitive information from unauthorized access and breaches.

5. The fifth part of the document explores the ethical implications of data collection and analysis. It discusses the need for transparency in data practices and the importance of obtaining informed consent from individuals whose data is being collected.

6. The sixth part of the document provides a summary of the key findings and recommendations. It reiterates the importance of a data-driven approach and offers practical advice for organizations looking to optimize their data management processes.

The preliminary assessment of each overflow should also have regard to possible "first foul flush" effects. These will depend on the nature of the sewage and the nature of the sewers upstream and their gradients. Such flows have the potential for severe pollution due to extremely high BOD₅ levels, potentially toxic levels of ammonia and hydrogen sulphide, and long term degradation associated with a high level of organic solids deposited on the bed of the receiving water which continue to depress dissolved oxygen levels and release nutrients.

In general, research has shown that sewage strength frequently increases significantly during this "first foul flush" period, which tends to approximate to the time of concentration 'T_c', following which the strength decreases and the effects of dilution become evident.

6.3 Detailed Design Requirements

A well designed and effective SWO must be capable of meeting the following general requirements:

- (1) good hydraulic control,
- (2) good separation of gross pollutants,
- (3) reliability,
- (4) minimal maintenance requirements, and
- (5) reasonable cost.

Generally, SWOs designed to WRC Report ER304E will meet these requirements though the hydraulic control (in particular for smaller SWOs) and the separation of gross solids needs careful consideration.



1. The first part of the document discusses the importance of maintaining accurate records of all transactions and activities. It emphasizes the need for transparency and accountability in all financial dealings.

2. The second part of the document outlines the various methods and techniques used to collect and analyze data. It includes a detailed description of the experimental procedures and the statistical methods employed to interpret the results.

3. The third part of the document presents the findings of the study. It shows that there is a significant correlation between the variables being studied, and that the results are consistent with the theoretical predictions.

4. The fourth part of the document discusses the implications of the findings and suggests areas for further research. It highlights the need for more comprehensive studies to fully understand the underlying mechanisms.

5. The fifth part of the document concludes the study and summarizes the key points. It reiterates the importance of the findings and the need for continued research in this field.



Hydraulic control at SWOs may be achieved by orifice plate, throttle pipe, vortex regulators or by adjustable penstocks. The WRC Report recommends that orifice throttles should have a diameter of opening of at least 200mm to reduce the risk of blockage. Likewise the diameter of a throttle pipe should not be less than 200mm and its length should ideally be between 3m and 30m long. Where penstocks are used, a clear ope capable of passing a 200 mm sphere should be provided. A vortex regulator may be used where the minimum required dimension of opening of 200mm cannot be met . These are usually of stainless steel construction and are fitted into the entrance of the continuation pipe. This device restricts the flow passing forward while allowing solid objects to pass through unrestricted. Generally each device is designed for the specific application and will require some maintenance from time to time.

Recommended chamber dimensions are given in the WRC Report for high side weir and stilling pond overflows to ensure good separation of gross polluting solids. The Report notes that, as performance is sensitive to minor changes in configuration, care should be taken not to deviate from the recommended chamber dimensions. Vortex overflows do not rely on a stilling effect to separate gross solids but require a significant drop in invert (1.5 times inlet diameter) and are therefore best suited to sewers with steeper gradients.

Hydro-dynamic separators are now available in prefabricated form which facilitates installation. These operate in a similar manner to vortex overflows with peripheral spill. Care should be taken in the selection of such devices to ensure that effective solids separation and hydraulic control is achieved.

The WRC Report recommends that screens should only be used in exceptional circumstances, for example, where the receiving water has a high amenity value. Where they are used, proper attention should be given to their location, the velocity of flow through the screens, raking and maintenance arrangements.

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60
61
62
63
64
65
66
67
68
69
70
71
72
73
74
75
76
77
78
79
80
81
82
83
84
85
86
87
88
89
90
91
92
93
94
95
96
97
98
99
100

101
102
103
104
105
106
107
108
109
110
111
112
113
114
115
116
117
118
119
120
121
122
123
124
125
126
127
128
129
130
131
132
133
134
135
136
137
138
139
140
141
142
143
144
145
146
147
148
149
150
151
152
153
154
155
156
157
158
159
160
161
162
163
164
165
166
167
168
169
170
171
172
173
174
175
176
177
178
179
180
181
182
183
184
185
186
187
188
189
190
191
192
193
194
195
196
197
198
199
200

201
202
203
204
205
206
207
208
209
210
211
212
213
214
215
216
217
218
219
220
221
222
223
224
225
226
227
228
229
230
231
232
233
234
235
236
237
238
239
240
241
242
243
244
245
246
247
248
249
250
251
252
253
254
255
256
257
258
259
260
261
262
263
264
265
266
267
268
269
270
271
272
273
274
275
276
277
278
279
280
281
282
283
284
285
286
287
288
289
290
291
292
293
294
295
296
297
298
299
300

6.4 Planning Methodologies

Various methods are available or are currently being developed for establishing discharge settings and acceptable spill regimes. The use of a particular method is dependent on the level of significance placed on the particular overflow and the receiving water at the discharge point. This should be based on a combined assessment of the size of the contributing catchment, the available dilution, and the classification of the receiving water at the location of the overflow.

The Urban Pollution Management Steering Group(UK) have developed criteria for the initial assessment. Table 1 in Appendix 1 sets out the criteria for freshwaters and Table 2 those for coastal waters and estuaries. Recommended approaches depending on the level of significance of the overflow are set out in Appendix 2. These appendices are included for general guidance only; it will be necessary to examine each situation on its merits.

7. Use of Storage

The use of storm water storage tanks is increasingly recommended as an alternative to the up-sizing of downstream capacity for reducing or eliminating storm water overflows. These tanks can be on-line or off-line and operate on the principle that flows in excess of the downstream capacity can be contained until the storm has sufficiently abated to allow the stored storm water to be returned to the sewer. The downstream capacity of the system is therefore maximised and overflows are minimised. The tanks are generally sized to contain the overflow that would arise from a storm with a specific return period, the 'design event'. Typically, a storm of one hour duration with a return period of five years is used for a built-up area.



1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60
61
62
63
64
65
66
67
68
69
70
71
72
73
74
75
76
77
78
79
80
81
82
83
84
85
86
87
88
89
90
91
92
93
94
95
96
97
98
99
100

The first part of the document discusses the importance of maintaining accurate records and the role of the various departments involved in the process. It highlights the need for clear communication and coordination between different units to ensure that all necessary information is captured and processed correctly.

The second part of the document provides a detailed overview of the current status of the project, including the progress made to date and the challenges that remain. It also outlines the proposed timeline for completion and the resources that will be required to meet these goals.

The final part of the document concludes with a summary of the key findings and recommendations. It emphasizes the importance of continued monitoring and evaluation throughout the project lifecycle to ensure that any deviations from the plan are identified and addressed promptly. The document also includes a list of references and a glossary of terms used throughout the text.



Page 1

Calibrated hydraulic models of sewer networks are being developed which will be used in conjunction with Time Series Rainfall³ to calculate overflow frequency and volumes. Use of sampling data of recognised parameters will allow estimates to be made of the pollution loads associated with such overflows.

Experience has shown that relatively modest storage volumes can appreciably reduce the frequency of overflows. While the reduction in the volume of overflow may not be as significant, overflows from major storm events will be relatively dilute discharges coinciding with relatively high flows in receiving waters. These conclusions are evident from consideration of the pattern of rainfall - occasional extreme events of high intensity and critical duration as compared with the majority of rainfall which tends to be of relatively low intensity.

The design of storm water storage tanks to effectively retain floatables and for ease of cleaning out and maintenance is very important. Traditionally, small storm tanks have been circular tanks designed exactly as for settling tanks. Larger storm tanks have tended to be rectangular in shape containing chain driven scraper equipment for cleaning out of settleable solids. A number of methods have now been developed including the "tipping bucket" method to wash out flood deposits at the end of tank use. This system comprises a container fabricated from stainless steel mounted on bearings on the end wall of the tank. The shape of the container is designed so that it automatically tips and empties when full thus flushing the settled deposits on the floor of the tank to the return sump. The number and capacity of tipping buckets required to effectively clean the tank is a function of the dimensions of the tank.

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60
61
62
63
64
65
66
67
68
69
70
71
72
73
74
75
76
77
78
79
80
81
82
83
84
85
86
87
88
89
90
91
92
93
94
95
96
97
98
99
100

101
102
103
104
105
106
107
108
109
110
111
112
113
114
115
116
117
118
119
120
121
122
123
124
125
126
127
128
129
130
131
132
133
134
135
136
137
138
139
140
141
142
143
144
145
146
147
148
149
150
151
152
153
154
155
156
157
158
159
160
161
162
163
164
165
166
167
168
169
170
171
172
173
174
175
176
177
178
179
180
181
182
183
184
185
186
187
188
189
190
191
192
193
194
195
196
197
198
199
200

201
202
203
204
205
206
207
208
209
210
211
212
213
214
215
216
217
218
219
220
221
222
223
224
225
226
227
228
229
230
231
232
233
234
235
236
237
238
239
240
241
242
243
244
245
246
247
248
249
250
251
252
253
254
255
256
257
258
259
260
261
262
263
264
265
266
267
268
269
270
271
272
273
274
275
276
277
278
279
280
281
282
283
284
285
286
287
288
289
290
291
292
293
294
295
296
297
298
299
300

8. Active Control

Sewer systems, particularly large trunk sewer networks in cities and large towns, have significant storage volumes which could be more effectively utilised to reduce pollution from SWOs. Active (or real time) control of a combined sewer system will result in optimised performance from existing control structures and more cost effective upgrading of the system. Sewer system controls using telemetry to collect information and remotely operated control structures have been introduced in some major cities in Europe and the U.S. to take advantage of these benefits thus reducing the amount of capital investment required. The tools necessary to be capable of implementing active control in a sewer system are:

- spare capacity in the sewers,
- spatial variability in rainfall,
- knowledge of rainfall pattern and the response of the sewer network,
- data collection sensors,
- decision making system,
- operating hardware including telemetry control system.

Such systems will bring the operation of sewerage networks into a new era of management control which to date has been employed only on the distribution of potable water. The key to such control is data collection and an understanding of the way the sewerage network responds to rainfall events. Such an understanding will allow the operator derive maximum benefit from

Faint, illegible text at the top of the page, possibly a header or introductory paragraph.

Second block of faint, illegible text in the middle of the page.

Third block of faint, illegible text at the bottom of the page.

the existing infrastructure and make informed decisions on cost effective improvements. From an Irish perspective, the potential for using active control would be limited to the larger urban centres where justification may be found for the costs involved.

9. Catchment Management

Future developments will undoubtedly include a more integrated approach to catchment management. This will result in river models together with sewage treatment works models and sewer network models being used to predict impacts of discharges on receiving waters for parameters such as dissolved oxygen, BOD₅, SS etc. This will lead to a better understanding of impacts on river water quality and will require that a much broader approach be adopted by engineers involved in the design and management of urban wastewater systems.

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60
61
62
63
64
65
66
67
68
69
70
71
72
73
74
75
76
77
78
79
80
81
82
83
84
85
86
87
88
89
90
91
92
93
94
95
96
97
98
99
100

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60
61
62
63
64
65
66
67
68
69
70
71
72
73
74
75
76
77
78
79
80
81
82
83
84
85
86
87
88
89
90
91
92
93
94
95
96
97
98
99
100

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60
61
62
63
64
65
66
67
68
69
70
71
72
73
74
75
76
77
78
79
80
81
82
83
84
85
86
87
88
89
90
91
92
93
94
95
96
97
98
99
100

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60
61
62
63
64
65
66
67
68
69
70
71
72
73
74
75
76
77
78
79
80
81
82
83
84
85
86
87
88
89
90
91
92
93
94
95
96
97
98
99
100

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60
61
62
63
64
65
66
67
68
69
70
71
72
73
74
75
76
77
78
79
80
81
82
83
84
85
86
87
88
89
90
91
92
93
94
95
96
97
98
99
100

Table 1 - UPM Indicative Impact Assessment Criteria for Storm Overflows to Freshwaters	
<p><u>Low Significance</u></p> <p>Dilution > 8 : 1 (foul DWF @ 95% ile flow) No interaction with other discharges</p>	
<p><u>Medium Significance</u></p> <p>Dilution < 8 : 1 Limited or no interaction with other discharges > 2,000 population equivalent Cyprinid fishery</p> <p>only if all these criteria apply.</p>	
<p><u>High Significance</u></p> <p>Dilution < 2 : 1 Interaction with other discharges > 10,000 population equivalent Cyprinid or salmonid fishery</p> <p>only if all of these criteria apply</p>	

Table 2 UPM Indicative Impact Assessment Criteria for Storm Overflows to Coastal Waters and Estuaries	
<p><u>Low Significance</u></p> <p>Estuarial and coastal waters not containing EC identified bathing waters and shellfish waters</p>	
<p><u>Medium Significance</u></p> <p>Population equivalent 2,000 - 10,000 Affects identified bathing waters and shellfish waters</p> <p>only if both criteria apply.</p>	
<p><u>High Significance</u></p> <p>Population equivalent > 10,000 Affects identified bathing waters and shellfish waters</p> <p>only if both criteria apply.</p>	

The following are the
 results of the
 study conducted
 on the
 effects of
 the
 program
 on the
 students
 of the
 school.

The results of the
 study conducted
 on the
 effects of
 the
 program
 on the
 students
 of the
 school.

Appendix 2

A. Low Significance SWOs

For overflows of low significance minimum data techniques such as "Formula A", SDD Method⁴, and QUALSOC⁵ would be used. The SDD Method developed by the Scottish Development Department is an improvement on "Formula A" in that an account, albeit arbitrary, is made of the available dilution in the receiving water to recommend the size of storage tanks to be provided at an overflow. These recommendations are reproduced in Table 3 attached. It should be noted that the dilution factor used is that normally used for treatment works discharges and is therefore not a measure of the dilution of the overflow discharge but simply a measure of the relative size of the sewerage system and the river. Apart from this improvement, the limitations listed above with regard to "Formula A" apply equally to the SDD Method.

QUALSOC was the next improvement to the use of "Formula A" and was developed by the Welsh Water Authority. In principle the method is a dilution model which estimates the flow and pollutant concentration being discharged from the overflow, dilutes this with the estimated flow in the river and compares the resulting pollutant concentration with desirable limits. However, it does this by estimating discharges without having a model of the sewerage network or of the river to calculate the impact of discharges from particular events. The results therefore require careful interpretation to determine what they actually mean. The main limitations of this approach are that considerable skill is required to answer the following questions:

- what flow is likely in the river when the overflow is occurring?



65

1
 2
 3
 4
 5
 6
 7
 8
 9
 10
 11
 12
 13
 14
 15
 16
 17
 18
 19
 20
 21
 22
 23
 24
 25
 26
 27
 28
 29
 30
 31
 32
 33
 34
 35
 36
 37
 38
 39
 40
 41
 42
 43
 44
 45
 46
 47
 48
 49
 50
 51
 52
 53
 54
 55
 56
 57
 58
 59
 60
 61
 62
 63
 64
 65
 66
 67
 68
 69
 70
 71
 72
 73
 74
 75
 76
 77
 78
 79
 80
 81
 82
 83
 84
 85
 86
 87
 88
 89
 90
 91
 92
 93
 94
 95
 96
 97
 98
 99
 100



101
 102
 103
 104
 105
 106
 107
 108
 109
 110
 111
 112
 113
 114
 115
 116
 117
 118
 119
 120
 121
 122
 123
 124
 125
 126
 127
 128
 129
 130
 131
 132
 133
 134
 135
 136
 137
 138
 139
 140
 141
 142
 143
 144
 145
 146
 147
 148
 149
 150
 151
 152
 153
 154
 155
 156
 157
 158
 159
 160
 161
 162
 163
 164
 165
 166
 167
 168
 169
 170
 171
 172
 173
 174
 175
 176
 177
 178
 179
 180
 181
 182
 183
 184
 185
 186
 187
 188
 189
 190
 191
 192
 193
 194
 195
 196
 197
 198
 199
 200



- how frequently will the overflow occur?
- what effect will a "first foul flush" have?
- is there interaction with other discharges?

Table 4 attached shows the National Rivers Authority (U.K.) guidance standards for the use of QUALSOC.

Relatively little data about the sewer network or receiving water is required for any of these methods. Shortcomings include the limited consideration given to the environmental impact of the discharge and the inability to size any in-sewer flow attenuation facilities to counter restricted downstream capacity. Solutions identified by these methods may not be the most cost effective as a result.

B. Medium Significance SWOs

For overflows of medium significance the use of a hydraulic model such as WALLRUS for the sewer network and what are known as the Interim Procedure and CARP⁶, (Comparative Acceptable River Pollution), would be appropriate.

The Interim Procedure estimates concentrations of various pollutants in overflow discharges and was first introduced in the second edition of the Sewerage Rehabilitation Manual⁷. It was designed to be used with a sewer hydraulic model which would predict the volume of overflow spill. The Procedure is based on a simplifying assumption that the pollutant concentration can be represented by an average concentration that was constant throughout the spill and that was the same for each rainfall event. The pollutant concentrations can be obtained in three

ways, given here in order of increasing cost:

1. Use the figures published with the Procedure which were derived from taking samples of overflow spill from about eight catchments and are reproduced in Table 5 attached.
2. Measure concentrations in the dry weather flow and use the dilution factors published with the Procedure which were derived from the same catchments and are reproduced in Table 6 attached.
3. Install sampling equipment at overflows and measure concentrations during a number of spill events to produce site specific average concentrations.

The CARP technique was developed by the WRC to give a method of comparing the impact of discharges to a receiving water. This involved looking not just at the total load of pollutant in a year, but at the pattern of discharge of pollutants throughout the year. It also developed a measure of the impact of the discharge which should be independent of the river size. There are limitations to the use of this procedure:

- The average concentrations for pollutant discharge are intentionally chosen to represent the highest likely concentration, and so will overestimate the spill.

1. The first section discusses the importance of maintaining accurate records of all transactions. It emphasizes that proper record-keeping is essential for the success of any business and for the protection of the interests of all parties involved.

2. The second section outlines the various methods used to collect and analyze data. It describes the process of gathering information from different sources and how this data is then processed to identify trends and patterns. This section also touches upon the use of statistical tools to interpret the results.

3. The third section focuses on the application of the collected data. It explains how the information is used to make informed decisions and to develop strategies that can improve performance. It also discusses the role of communication in ensuring that all team members are aware of the findings and the actions to be taken.

4. The fourth section provides a detailed look at the challenges faced during the data analysis process. It highlights common pitfalls such as incomplete data, bias, and errors in calculation. It offers practical advice on how to overcome these challenges and ensure the reliability of the results. This section also mentions the importance of regular updates and reviews to keep the data current and relevant.

5. The fifth and final section summarizes the key findings and conclusions of the study. It reiterates the importance of a systematic approach to data collection and analysis and the potential benefits of using data-driven insights. It ends with a call to action, encouraging readers to apply these principles in their own work.

- The average concentrations do not take into account change in concentration during an event in particular "first foul flush" effects or the beneficial effects of storage tanks in capturing the "first foul flush" and only spilling the later, cleaner flow.

- Only one standard river has been defined for this procedure which is for a Class 2, fast flowing stream. There is a doubt as to whether the standard applies to rivers of different character, for example, lowland rivers or very large rivers.

- The results can be influenced by the choice of river reach length used in the calculations.

For coastal discharges the hydraulic network model can be used directly to assess compliance with a spill frequency criterion. While there is a need for a considerably larger amount of data for these methods, their use in addition to taking the impact on the receiving waters into consideration, also allows storm water detention facilities to be sized with some confidence.

C. High Significance Overflows

For overflows of high significance, the use of complex models is justifiable. For the inland waters a sewer quality simulation model such as MOSQUITO⁸ and a dynamic impact model such as MIKE 11⁹ would be employed, in addition to the WALLRUS model, together with a method to generate suitable Time Series Rainfall data where adequate historical records do not exist.

1945

...

...

...

...

...

MOSQUITO has been developed to simulate the changing quality of sewage throughout a storm event and models BOD, COD Suspended Solids and Ammonia. Standard pollutant mixture characteristics are given for use where local data are not available. Characteristics are also given for pipe sediments in combined systems and for pollutants initially in gully pots. Verification of the model is essential and is structured so that the standard values used to construct the model are replaced by measured values in stages, and only if necessary. This ensures that only essential data need be collected and a catchment which is accurately represented using the standard values can be modelled with the minimum of data collection.

MIKE 11 is a software package for simulating river water quality for selected parameters which can be used to assess the impact of storm water overflow discharges and check compliance with water quality objectives.

For marine situations, a marine advection/dispersion model would be required to assess the bacteriological impact relative to the criteria set down in the Bathing Water Directive.

As the costs associated with data collection, setting up, calibration and verification of these models are substantial their use should be restricted to the major urban schemes with high significance overflows. Where they are used, the benefits of having a detailed model of the existing system and the ability to test the effects of various options allows much greater confidence in the proposed solution. This should lead to more cost effective



The first part of the document discusses the importance of maintaining accurate records. It emphasizes that every transaction should be properly documented to ensure transparency and accountability. This includes recording the date, amount, and purpose of each entry.

In the second section, the author outlines the various methods used to collect and analyze data. These methods include direct observation, interviews, and the use of specialized software tools. Each method has its own strengths and limitations, and the choice of method depends on the specific requirements of the study.

The third part of the document focuses on the results of the research. It presents a detailed analysis of the data collected, highlighting key trends and patterns. The author also discusses the implications of these findings for the field of study and offers suggestions for further research.

Finally, the document concludes with a summary of the main points and a final thought on the importance of thorough and honest reporting in research. The author expresses hope that the findings presented here will be helpful to others in the field.



solutions being proposed.

The level of investment that should be put into the preparation of these models should, of course, be assessed by taking into consideration, not alone the likely savings to be made in the short term by the construction of the more cost effective solutions that will be developed by their use, but also by the ongoing benefits such models will provide in assessing the performance of the augmented sewer network.



The following table shows the results of the survey conducted in the year 2000. The data is presented in a tabular format with columns for the category and the corresponding value.

Category	Value
Category 1	1200
Category 2	1500
Category 3	1800
Category 4	2100
Category 5	2400
Category 6	2700
Category 7	3000
Category 8	3300
Category 9	3600
Category 10	3900



Dilution Factor	Overflow Setting	Storage Tank
> 8	Formula A	None
> 6	Formula A + 455P or Formula A	None
> 4	Formula A	40 l/hd
> 2	Formula A	40 l/hd
> 1	Formula A	80 l/hd
	Formula A	120 l/hd

Dilution factor = Average DWF / 95% ile flow.

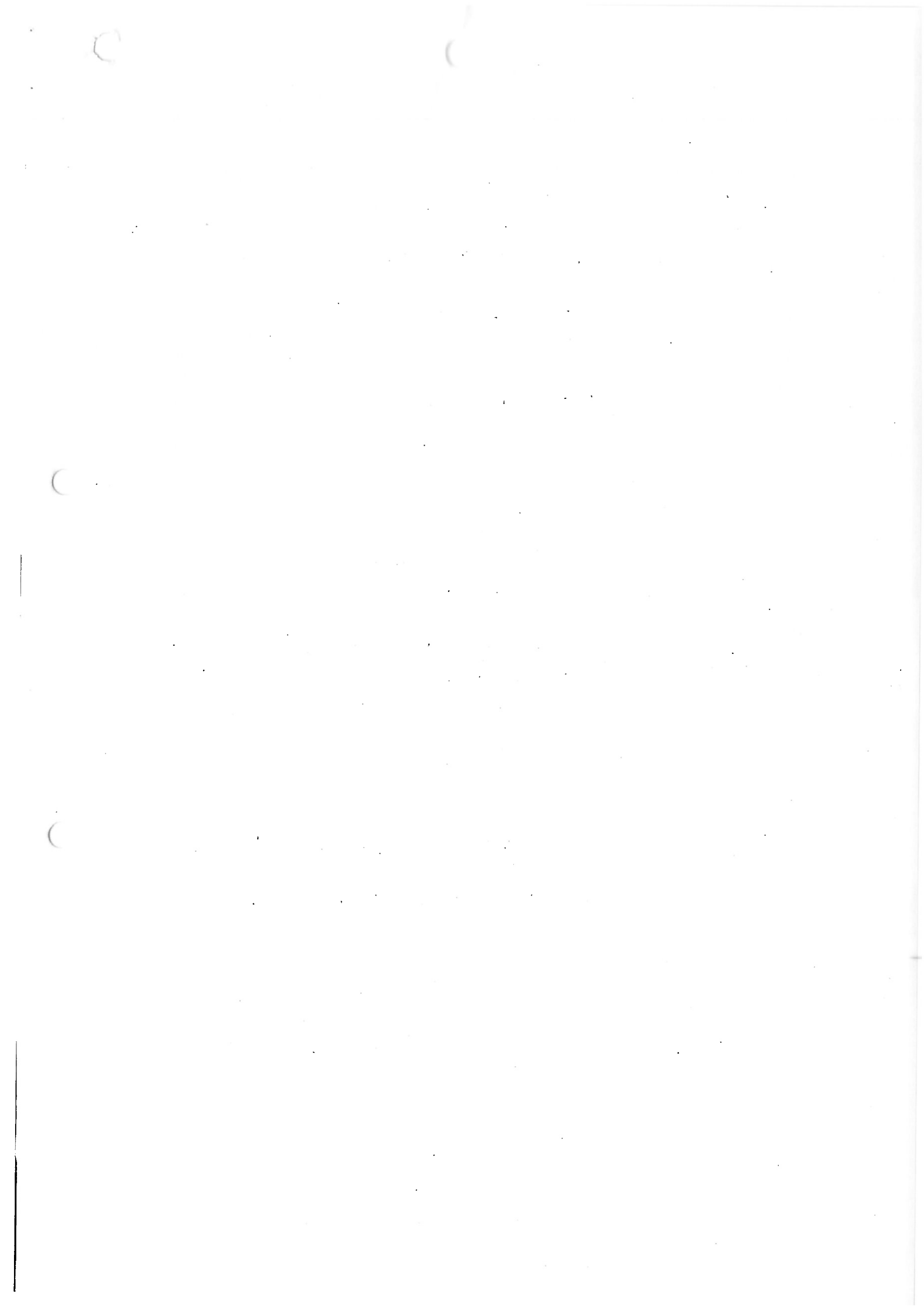
River Class	BOD Limit		
	95%ile mg/l	99%ile mg/l	MAC mg/l
1B	5	9	12
2	9	16	20

Determinand	Flat Catchments	Steep Catchments
	mg/l	mg/l
BOD	125	75
COD	390	330
NH3	8	4
SS	420	340

Determinand	Flat Catchments	Steep Catchments
	mg/l	mg/l
BOD	0.5	0.3
COD	0.7	0.9
NH3	0.3	0.3
SS	1.5	1.5

References

1. Technical Committee on Storm Overflows and the Disposal of Storm Sewage; Final Report. Ministry of Housing and Local Government. HMSO 1970.
2. A guide to the design of storm overflow structures. Water Research Centre Report ER304E 1988.
3. Time Series Rainfall. Water Research Centre Report ER195E.
4. Storm Sewage Separation and Disposal. - Scottish Development Department HMSO 1977.
5. QUALSOC. Storm Sewage Overflow Policy Group, October 1988. Welsh Water Authority.
6. Interim Water Quality Planning Procedures for Controlling Intermittent Pollution from Storm Sewage Overflows. Water Research Centre Report ER317E 1988.
7. Sewerage Rehabilitation Manual - 2nd Edition. WRC 1986.
8. MOSQUITO User Manual. HR Wallingford 1991.
9. MIKE 11 User Guide. Danish Hydraulic Institute 1990.





Alan Armstrong
Office 25,
Calbro Court, Tuam Road,
Galway
H91YKH

29 April 2022

Re: CDS21008799 pre-connection enquiry - Subject to contract | Contract denied
Connection for Business Connection of 1 unit(s) at Turnpike Road, Ennis, Clare

Dear Sir/Madam,

Irish Water has reviewed your pre-connection enquiry in relation to a Water & Wastewater connection at Turnpike Road, Ennis, Clare (the Premises). Based upon the details you have provided with your pre-connection enquiry and on our desk top analysis of the capacity currently available in the Irish Water network(s) as assessed by Irish Water, we wish to advise you that your proposed connection to the Irish Water network(s) can be facilitated at this moment in time.

SERVICE	OUTCOME OF PRE-CONNECTION ENQUIRY <u>THIS IS NOT A CONNECTION OFFER. YOU MUST APPLY FOR A CONNECTION(S) TO THE IRISH WATER NETWORK(S) IF YOU WISH TO PROCEED.</u>
Water Connection	Feasible without infrastructure upgrade by Irish Water
Wastewater Connection	Feasible without infrastructure upgrade by Irish Water
SITE SPECIFIC COMMENTS	
Water Connection	There is sufficient capacity for the proposed development.
Wastewater Connection	There is sufficient capacity for the proposed development.
The design and construction of the Water & Wastewater pipes and related infrastructure to be installed in this development shall comply with the Irish Water Connections and Developer Services Standard Details and Codes of Practice that are available on the Irish Water website. Irish Water reserves the right to supplement these requirements with Codes of Practice and these will be issued with the connection agreement.	

The following information is provided for your information only. It is not intended to constitute an offer of insurance or any other financial product. Please read the policy carefully before you decide whether to purchase it.

The policy is subject to the terms, conditions, exclusions, and limitations set forth in the policy. The policy is not a contract until it is signed by you and the insurer.

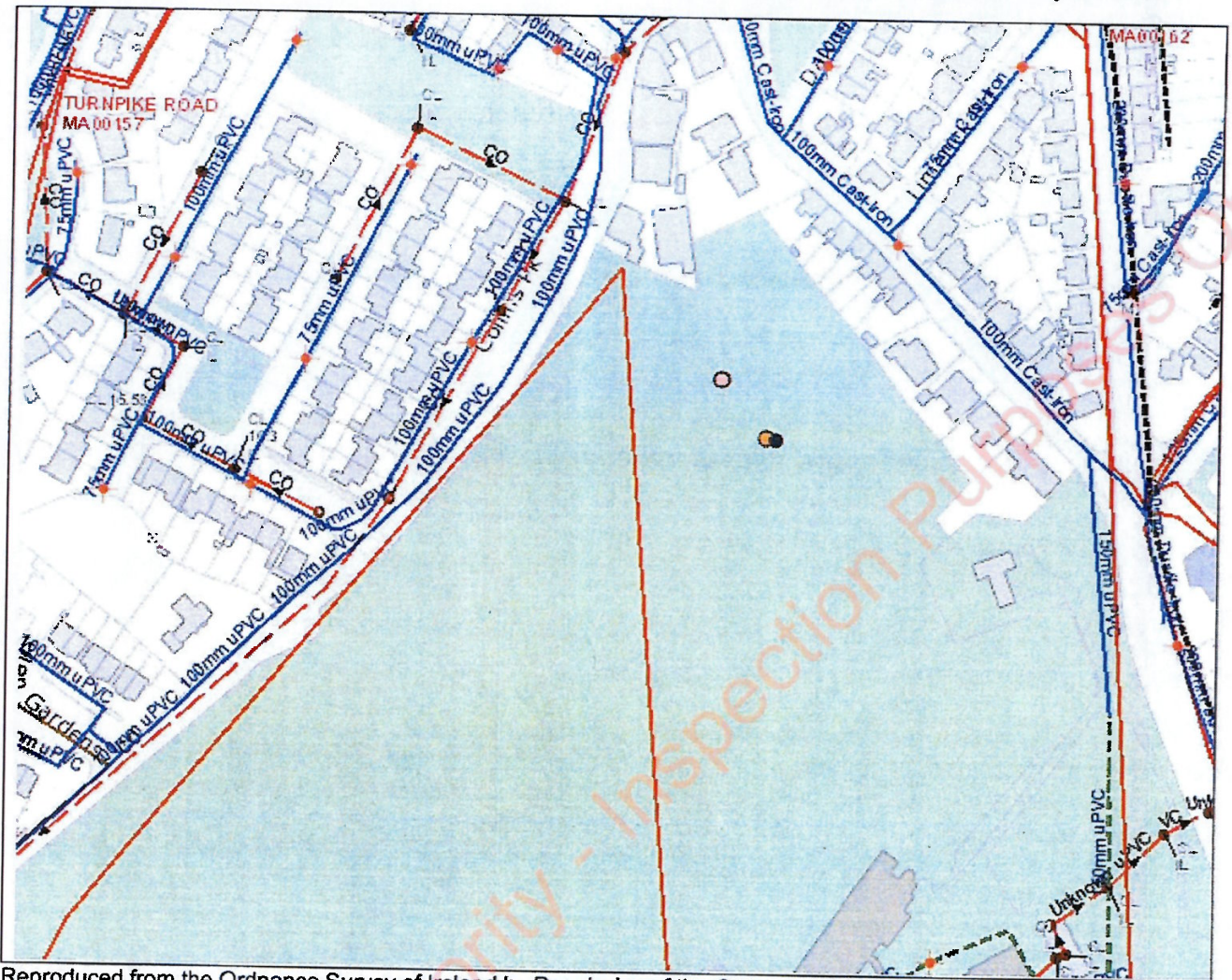
The policy is not a contract until it is signed by you and the insurer.

Description of Policy	Amount	Rate
The policy provides for the payment of a death benefit of \$100,000.00.	\$100,000.00	\$10.00 per month
The policy provides for the payment of a death benefit of \$200,000.00.	\$200,000.00	\$20.00 per month
The policy provides for the payment of a death benefit of \$500,000.00.	\$500,000.00	\$50.00 per month
The policy provides for the payment of a death benefit of \$1,000,000.00.	\$1,000,000.00	\$100.00 per month
The policy provides for the payment of a death benefit of \$2,000,000.00.	\$2,000,000.00	\$200.00 per month
The policy provides for the payment of a death benefit of \$5,000,000.00.	\$5,000,000.00	\$500.00 per month
The policy provides for the payment of a death benefit of \$10,000,000.00.	\$10,000,000.00	\$1,000.00 per month

The policy is not a contract until it is signed by you and the insurer.

The policy is not a contract until it is signed by you and the insurer.

The map included below outlines the current Irish Water infrastructure adjacent to your site:



Reproduced from the Ordnance Survey of Ireland by Permission of the Government. License No. 3-3-34

Whilst every care has been taken in its compilation Irish Water gives this information as to the position of its underground network as a general guide only on the strict understanding that it is based on the best available information provided by each Local Authority in Ireland to Irish Water. Irish Water can assume no responsibility for and give no guarantees, undertakings or warranties concerning the accuracy, completeness or up to date nature of the information provided and does not accept any liability whatsoever arising from any errors or omissions. This information should not be relied upon in the event of excavations or any other works being carried out in the vicinity of the Irish Water underground network. The onus is on the parties carrying out excavations or any other works to ensure the exact location of the Irish Water underground network is identified prior to excavations or any other works being carried out. Service connection pipes are not generally shown but their presence should be anticipated.



Faint, illegible text or a second stamp located below the first one, also centered on the page. The text is too light to be read.

General Notes:

- 1) The initial assessment referred to above is carried out taking into account water demand and wastewater discharge volumes and infrastructure details on the date of the assessment. **The availability of capacity may change at any date after this assessment.**
- 2) This feedback does not constitute a contract in whole or in part to provide a connection to any Irish Water infrastructure. All feasibility assessments are subject to the constraints of the Irish Water Capital Investment Plan.
- 3) The feedback provided is subject to a Connection Agreement/contract being signed at a later date.
- 4) A Connection Agreement will be required to commencing the connection works associated with the enquiry this can be applied for at <https://www.water.ie/connections/get-connected/>
- 5) A Connection Agreement cannot be issued until all statutory approvals are successfully in place.
- 6) Irish Water Connection Policy/ Charges can be found at <https://www.water.ie/connections/information/connection-charges/>
- 7) Please note the Confirmation of Feasibility does not extend to your fire flow requirements.
- 8) Irish Water is not responsible for the management or disposal of storm water or ground waters. You are advised to contact the relevant Local Authority to discuss the management or disposal of proposed storm water or ground water discharges
- 9) To access Irish Water Maps email datarequests@water.ie
- 10) All works to the Irish Water infrastructure, including works in the Public Space, shall have to be carried out by Irish Water.

If you have any further questions, please contact Shane Mcmanus from the design team by email to shane.mcmanus@water.ie For further information, visit www.water.ie/connections.

Yours sincerely,



Yvonne Harris

Head of Customer Operations

1. The first part of the document discusses the importance of maintaining accurate records of all transactions. It emphasizes that this is crucial for the company's financial health and for providing transparency to stakeholders.

2. The second part outlines the specific procedures for recording transactions. It details the steps from initial entry to final review, ensuring that all data is captured and verified.

3. The third part addresses the role of technology in modern accounting. It highlights how software solutions can streamline processes and reduce the risk of human error.

4. The fourth part discusses the importance of regular audits and reconciliations. It explains how these practices help identify discrepancies early and ensure the integrity of the financial data.

5. The fifth part covers the legal and regulatory requirements that govern financial reporting. It provides an overview of the standards that must be followed to ensure compliance.

6. The sixth part focuses on the importance of clear communication and collaboration between different departments. It stresses that everyone has a role to play in maintaining accurate financial records.

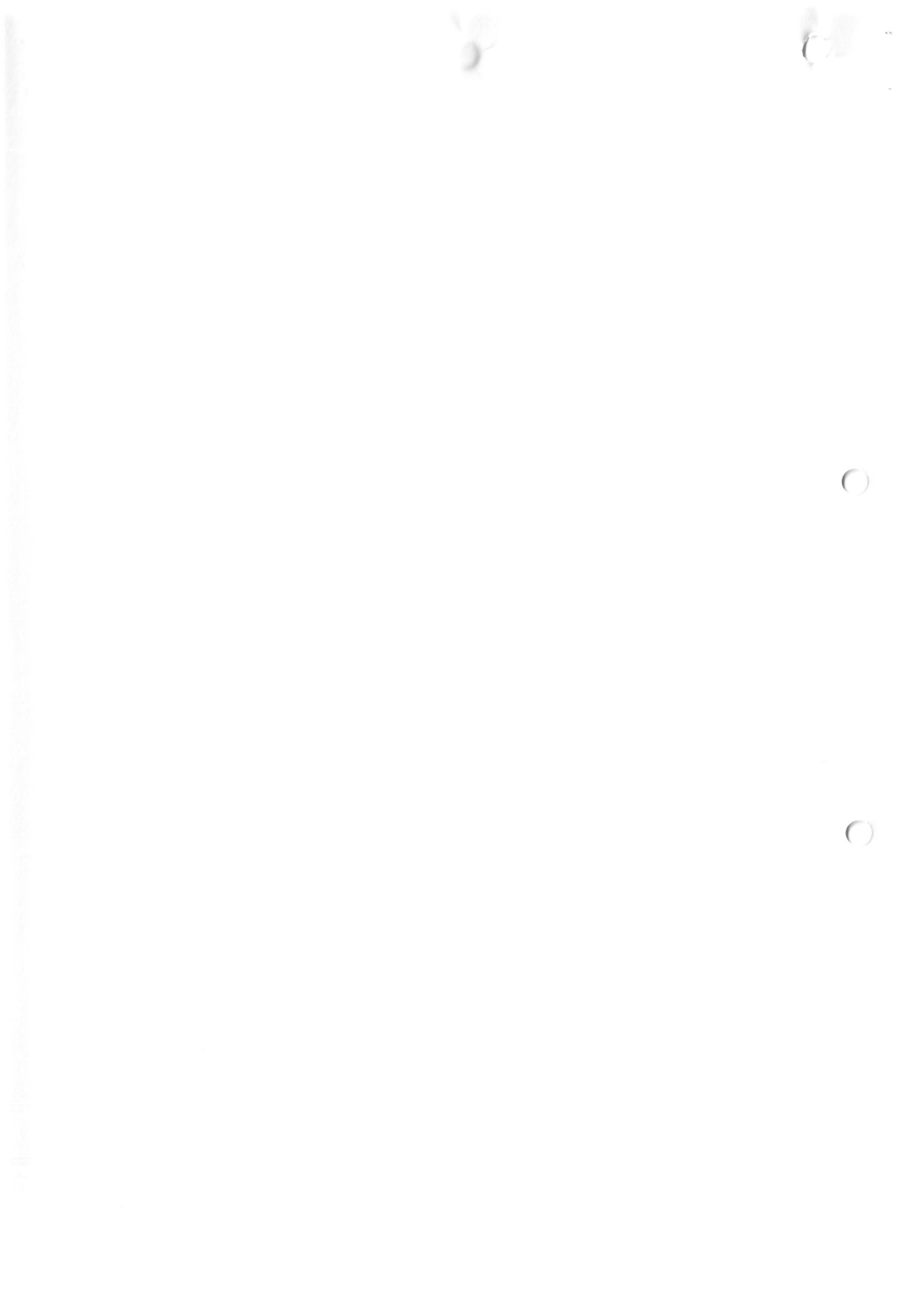
7. The seventh part discusses the impact of accurate financial data on strategic decision-making. It shows how reliable information is essential for identifying opportunities and managing risks.

8. The eighth part provides a summary of the key points discussed throughout the document. It reinforces the message that accuracy and transparency are the foundation of successful financial management.

9. The final part offers some concluding thoughts and encourages a commitment to high standards of financial reporting.

Page 1 of 1

Clare Planning Authority - Inspection Purposes Only



Our Ref: AIER128

Date: 09 June 2023

Michael Duffy
1 Clós na hEaglaise,
Kilfenora,
Co. Clare.

duffycivileng@gmail.com

Uisce Éireann
Teach Colvill
24-26 Sráid Thalbóid
Baile Átha Cliath 1
D01 NP86
Éire

Uisce Éireann
Colvill House
24-26 Talbot Street
Dublin 1
D01 NP86
Ireland

T: +353 1 89 25000
F: +353 1 89 25001
www.water.ie

Dear Mr. Duffy,

I refer to your request dated 25 May 2023 and received by Uisce Éireann on 25 May 2023 under EU Directive 2003/4/EC (the "**Directive**") (as transposed by the European Communities (Access to Information on the Environment) Regulations 2007–2018 (the "**Regulations**") for the following information:

- *"All details regarding an assessment of pre-connection enquiry CDS21008799 and especially around the desktop analysis of the capacity currently available in the Irish Water networks as referred to in correspondence issued on 29 April 2022 (copy attached)."*

Following consideration of the provisions of the AIE Regulations, Uisce Éireann has reached a decision to grant your request on 09 June 2023. If you have any queries regarding this correspondence or would like to discuss your request further please contact foi@water.ie

I attach the relevant records returned by the decision-maker processing your AIE request. The decision-maker has advised that the Pre-Connection Enquiry (PCE) process involves three steps:

1. Customer submits completed PCE form to Uisce Éireann (Uisce Éireann).
2. Uisce Éireann/Local Authority Water Services assess the proposal and capacity in the Uisce Éireann assets;
3. Confirmation of Feasibility (COF) letter is issued to the Customer.

The information attached contains details of the assessments (Desk Top Analysis of Capacity) extracted from our Microsoft Dynamics 365 (D365) system that different stakeholders feed into.

Under Article 11 of the Regulations, you have a right to seek an internal review of our decision. An internal review must be requested within one month of receipt of our decision. There is no charge for requesting an internal review. If you would like to seek an internal review, you can do so by sending an email to foi@water.ie

Yours sincerely,

Noel Shannon
AIE Officer

Uisce Éireann

Pre-connection enquiry form

Business developments, mixed use developments, housing developments

This form is to be filled out by applicants enquiring about the feasibility of a water and/or wastewater connection to Irish Water infrastructure. If completing this form by hand, please use BLOCK CAPITALS and black ink.

Please refer to the **Guide to completing the pre-connection enquiry form** on page 13 of this document when completing the form.

*** Denotes mandatory/ required field. Please note, if mandatory fields are not completed the application will be returned.**

Section A | Applicant details

1 *Applicant details:

Registered company name (if applicable): H S E M i d w e s t

Trading name (if applicable): N / A

Company registration number (if applicable): N / A

If you are not a registered company/business, please provide the applicant's name:

N / a

*Contact name: [Redacted]

*Postal address: S e e N o t e 1

*Eircode: [Redacted]

*Telephone: [Redacted]

Mobile: [Redacted]

*Email: [Redacted]

2 Agent details (if applicable):

Contact name: A l a n A r m s t r o n g

Company name (if applicable): D . F a l l o n C o n s u l t . E n g

Postal address: O f f i c e 2 5 , C a l b r o C o u r t ,

T u a m R o a d , G a l w a y

Eircode: H 9 1 Y K H 4

Telephone: [Redacted]

Email: [Redacted]

THE UNIVERSITY OF CHICAGO
DEPARTMENT OF CHEMISTRY
5800 S. UNIVERSITY AVENUE
CHICAGO, ILLINOIS 60637

RECEIVED
DATE

BY

RESEARCH ASSISTANT

Section C | Development details

8 Please outline the domestic and/or industry/business use proposed:

Property type	Number of units	Property type	Number of units	Property type	Number of units
House		Apartments		Agricultural	
Office		School		Retail unit	
Residential care home		Institution		Industrial unit	
Hotel		Factory		Other	1
Other (please specify type)		100 Bed Community Nursing Unit			

9 *Approximate start date of proposed development:

0
1 /
 0
4 /
 2
0
2
3

10 *Is the development multi-phased?

Yes No

If 'Yes', application must include a master-plan identifying the development phases and the current phase number.

If 'Yes', please provide details of variations in water demand volumes and wastewater discharge loads due to phasing requirements.

11 *Please indicate the type of connection required by ticking the appropriate box below:

Water Please go to Section D

Wastewater Please go to Section E

Both Please complete both Sections D and E

Main body of faint text, likely the primary content of the document, spanning the upper middle section.

Second main body of faint text, continuing the content from the previous section, located in the lower middle part of the page.

Final section of faint text at the bottom of the page, possibly a conclusion or footer area.

Section D | Water connection and demand details

- 12 ***Is there an existing connection to public water mains at the site?** Yes No
- 12.1 If yes, is this enquiry for an additional connection to one already installed? Yes No
- 12.2 If yes, is this enquiry to increase the size of an existing connection? Yes No

13 **Approximate date water connection is required:** 01 / 04 / 2023

14 ***What diameter of water connection is required to service the development?** 150 mm

- 15 ***Is more than one connection required to the public infrastructure to service this development?** Yes No
- If 'Yes', how many?

16 **Please indicate the business water demand (shops, offices, schools, hotels, restaurants, etc.):**

Post-development peak hour water demand	0.725 (See Calculation 2)	l/s
Post-development average hour water demand	0.58 (See Calculation 1)	l/s

Please include calculations on the attached sheet provided. Where there will be a daily/weekly/seasonal variation in the water demand profile, please provide all such details.

17 **Please indicate the industrial water demand (industry-specific water requirements):**

Post-development peak hour water demand	N/A	l/s
Post-development average hour water demand	N/A	l/s

Please include calculations on the attached sheet provided. Where there will be a daily/weekly/seasonal variation in the water demand profile, please provide all such details.

18 **What is the existing ground level at the property boundary at connection point (if known) above Malin Head Ordnance Datum?** 15.62 m

19 **What is the highest finished floor level of the proposed development above Malin Head Ordnance Datum?** 14.78 m

20 **Is on-site water storage being provided?** Yes No

Please include calculations on the attached sheet provided.

1. The first part of the document discusses the importance of maintaining accurate records of all transactions. This is essential for ensuring the integrity of the financial data and for providing a clear audit trail.

2. The second part of the document outlines the various methods used to collect and analyze data. These methods include direct observation, interviews, and the use of specialized software tools.

3. The third part of the document describes the results of the data collection and analysis. The findings indicate that there are significant areas for improvement in the current processes, particularly in the areas of data accuracy and reporting.

4. The fourth part of the document provides recommendations for addressing the identified issues. These recommendations include implementing more rigorous data entry protocols and investing in more advanced data analysis software.

5. The fifth part of the document discusses the implementation of the recommended changes. This involves a phased approach, starting with the most critical areas and then moving on to other parts of the system.

6. The sixth part of the document provides a summary of the overall findings and conclusions. It emphasizes the need for ongoing monitoring and evaluation to ensure that the improvements are sustained over time.

7. The seventh part of the document includes a list of references and a list of appendices. The references provide additional information on the topics discussed in the document, and the appendices contain supplementary data and documents.

1. The first part of the document discusses the importance of maintaining accurate records of all transactions. This is essential for ensuring the integrity of the financial data and for providing a clear audit trail.

2. The second part of the document outlines the various methods used to collect and analyze data. These methods include direct observation, interviews, and the use of specialized software tools.

3. The third part of the document describes the results of the data collection and analysis. It shows that there are significant differences in the way that different departments handle their data, which can lead to inconsistencies and errors.

4. The fourth part of the document discusses the implications of these findings. It suggests that there is a need for a more standardized approach to data collection and analysis across all departments. This would help to ensure that the data is accurate and consistent, and that it can be used effectively for decision-making.

5. The fifth part of the document provides a summary of the key findings and recommendations. It emphasizes the importance of maintaining accurate records and of using standardized methods for data collection and analysis. It also suggests that there should be a focus on training staff to ensure that they are using the correct methods and that they are aware of the importance of accuracy.

6. The sixth part of the document discusses the next steps that need to be taken. It suggests that there should be a review of the current data collection and analysis processes, and that there should be a focus on identifying areas for improvement. It also suggests that there should be a focus on developing a more standardized approach to data collection and analysis, and that there should be a focus on training staff to ensure that they are using the correct methods and that they are aware of the importance of accuracy.

7. The seventh part of the document provides a conclusion. It emphasizes the importance of maintaining accurate records and of using standardized methods for data collection and analysis. It also suggests that there should be a focus on training staff to ensure that they are using the correct methods and that they are aware of the importance of accuracy.

1. The first part of the document discusses the importance of maintaining accurate records of all transactions. This is essential for ensuring the integrity of the financial system and for providing a clear audit trail.

2. The second part of the document outlines the various methods used to collect and analyze data. These methods include direct observation, interviews, and the use of specialized software tools.

3. The third part of the document describes the results of the data collection and analysis. It shows that there are significant differences in the way that different departments handle their data, which can lead to inconsistencies and errors.

4. The fourth part of the document discusses the implications of these findings. It suggests that a more standardized approach to data collection and analysis is needed to improve the accuracy and reliability of the financial system.

5. The fifth part of the document provides a detailed description of the proposed system. This system would use a combination of manual and automated methods to collect and analyze data, ensuring that all transactions are recorded accurately and consistently.

6. The sixth part of the document discusses the implementation of the proposed system. It outlines the steps that need to be taken to ensure that the system is properly installed and that all staff are trained to use it effectively.

7. The seventh part of the document describes the results of the implementation. It shows that the proposed system has been successfully installed and that staff are now using it to collect and analyze data. This has led to a significant improvement in the accuracy and reliability of the financial system.

8. The eighth part of the document discusses the future of the system. It suggests that the system should be regularly updated and that new methods should be developed to improve its performance and to meet the changing needs of the organization.

9. The ninth part of the document provides a conclusion to the study. It summarizes the main findings and suggests that the proposed system is a viable solution to the problems identified in the study.

10. The tenth part of the document provides a list of references. These references include books, articles, and other sources that have been used in the study.

Please note that if you are sending us your application form and any associated documentation by email, the maximum file size that we can receive in any one email is 35MB.

Please note, if mandatory fields are not completed the application will be returned.

Irish Water is subject to the provisions of the Freedom of Information Act 2014 ("FOIA") and the codes of practice issued under FOIA as may be amended, updated or replaced from time to time. The FOIA enables members of the public to obtain access to records held by public bodies subject to certain exemptions such as where the requested records may not be released, for example to protect another individual's privacy rights or to protect commercially sensitive information. Please clearly label any document or part thereof which contains commercially sensitive information. Irish Water accepts no responsibility for any loss or damage arising as a result of its processing of freedom of information requests.

Faint, illegible text, possibly bleed-through from the reverse side of the page. The text is arranged in several lines and appears to be a list or a set of instructions.

Calculations

Water demand

Please note that the site is currently a Greenfield site with no existing water demand.

Calculation 1. Proposed Average Water Demand

Staff No's = 90

Patients No's = 125

Allowance for visitors = 35

Total = 250

Allow for 60 Litres/Person/Day for Staff

Therefore, loading = $90 \times 60 = 5,400$ Litres/Day

We require this in l/s, therefore $5,400 \text{ l/day} = 0.063 \text{ l/s}$

Allow for 350 Litres/Person/Day for Patients {As per IW Wastewater Code of Practice Page 172}

Therefore, loading = $125 \times 350 = 43,750$ Litres/Day

We require this in l/s, therefore $43,750 \text{ l/day} = 0.506 \text{ l/s}$

Allow for 30 Litres/Person/Day for Visitors

Therefore, loading = $35 \times 30 = 1050$ Litres/Day

We require this in l/s, therefore $1050 \text{ l/day} = 0.012 \text{ l/s}$

Total Demand = $0.063 + 0.506 + 0.012 = 0.581 \text{ l/s}$

Calculation 2. Proposed Peak Water Demand.

As per IW Code of Practice an additional 25% should be allowed for for peak time demand, therefore:

$0.581 \text{ l/s} + 25\% = 0.73 \text{ l/s}$ (Rounded Up)

...the ...
...the ...
...the ...

...the ...
...the ...
...the ...

...the ...
...the ...
...the ...

...the ...
...the ...
...the ...

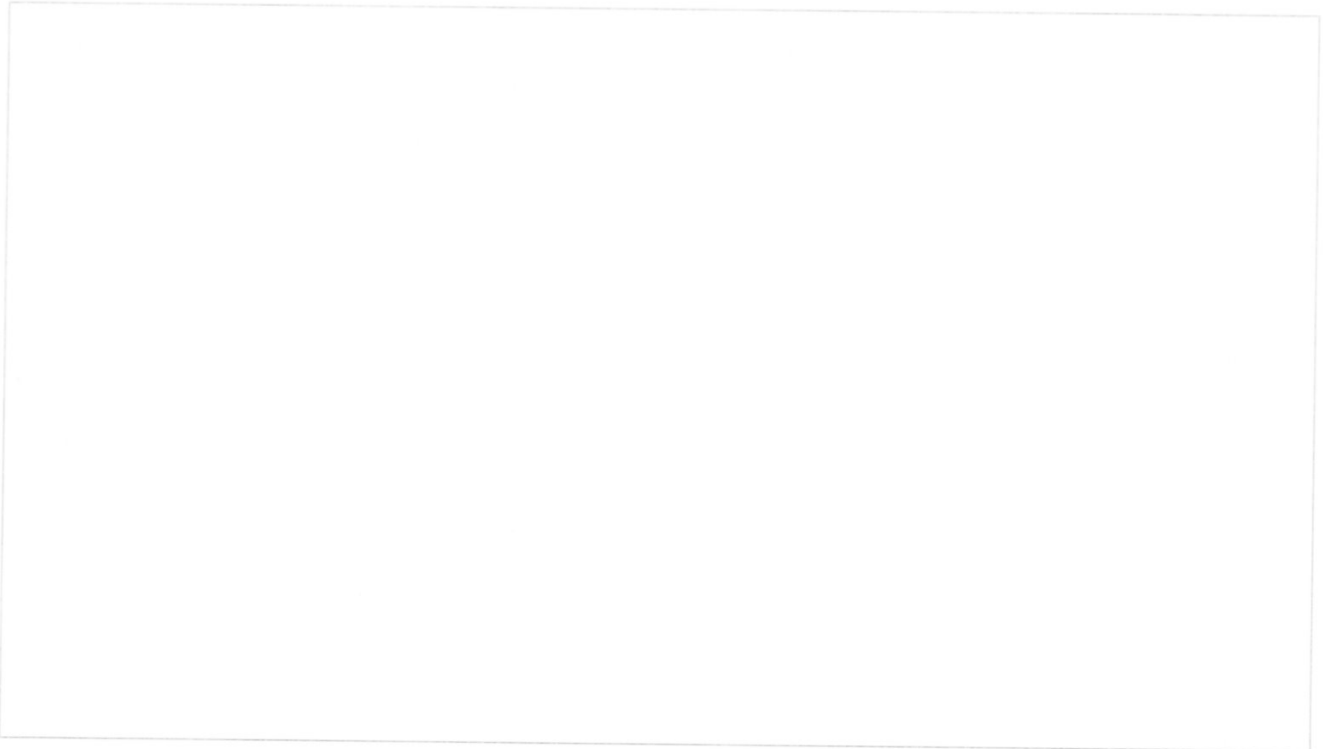
...the ...
...the ...
...the ...

...the ...
...the ...
...the ...

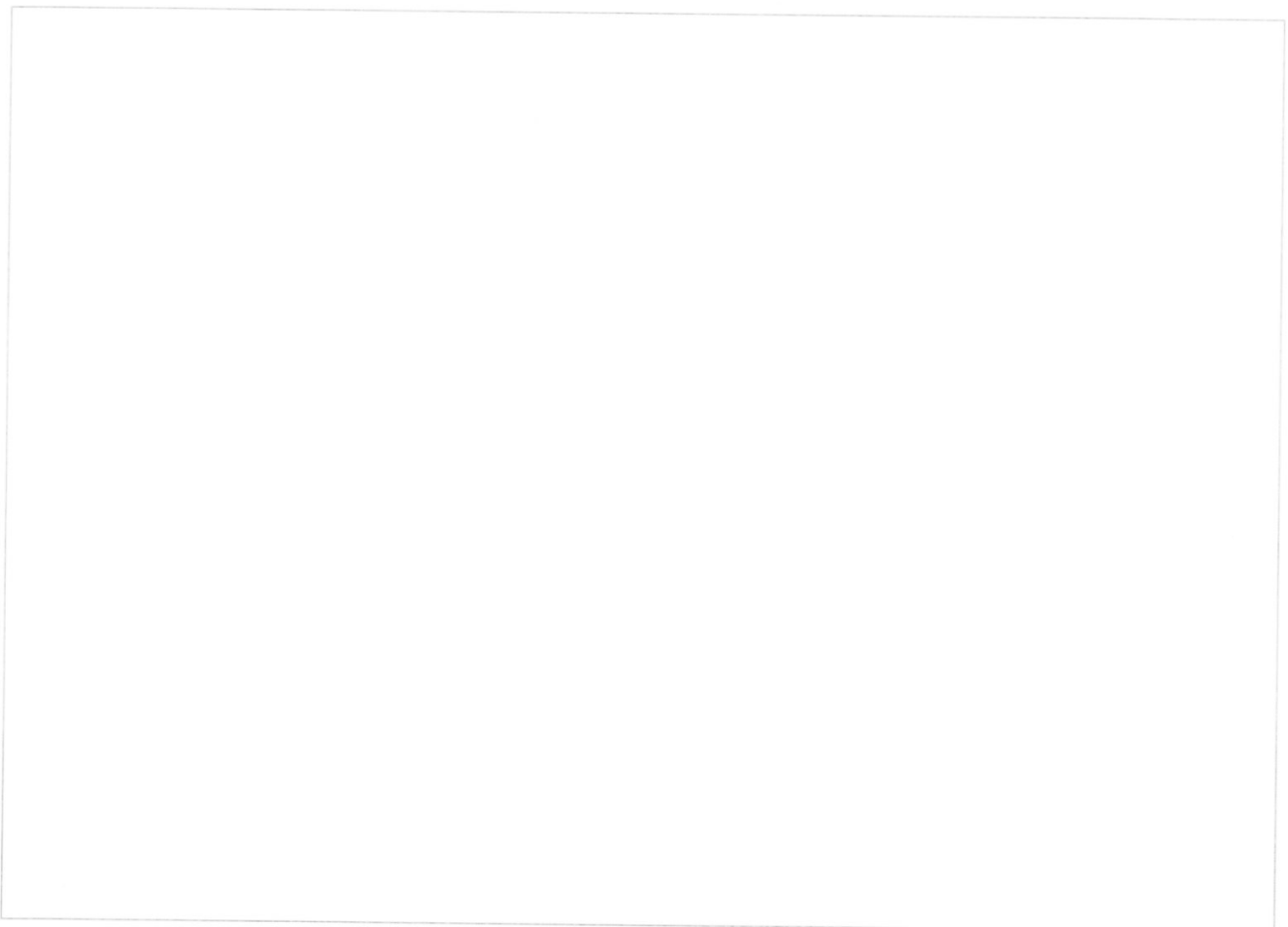
...the ...
...the ...
...the ...



On-site storage



Fire flow requirements





Foul wastewater discharge

Calculation 3 - Total Average Foul Wastewater Demand

See calculation of 0.581l/s as per calculation 1 above.

Apply 6 x dry weather flow (dwf), therefore, $6 \times 0.573/s = 3.49 \text{ l/s}$ (Rounded Up)

Calculation 4 - Total Peak Foul Wastewater Demand

See calculation of 0.73l/s as per calculation 2 above.

Apply 6 x dry weather flow (dwf), therefore, $6 \times 0.716/s = 4.36 \text{ l/s}$ (Rounded Up)

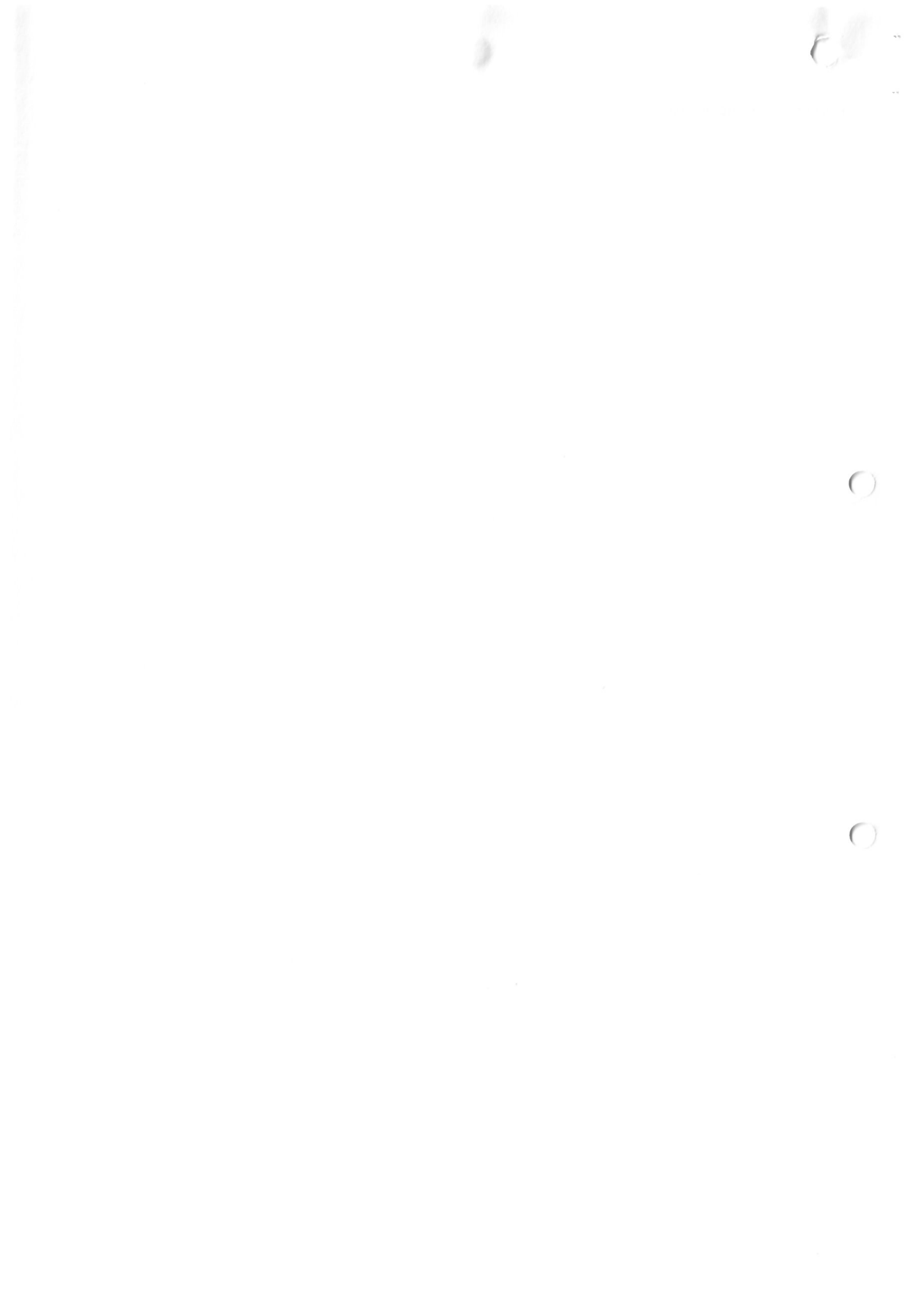
100
101
102
103
104
105
106
107
108

109
110
111
112
113
114
115
116
117
118
119
120
121
122
123
124
125
126
127
128
129
130
131
132
133
134
135
136
137
138
139
140
141
142
143
144
145
146
147
148
149
150
151
152
153
154
155
156
157
158
159
160
161
162
163
164
165
166
167
168
169
170
171
172
173
174
175
176
177
178
179
180
181
182
183
184
185
186
187
188
189
190
191
192
193
194
195
196
197
198
199
200

201
202
203
204
205
206
207
208
209
210
211
212
213
214
215
216
217
218
219
220
221
222
223
224
225
226
227
228
229
230
231
232
233
234
235
236
237
238
239
240
241
242
243
244
245
246
247
248
249
250
251
252
253
254
255
256
257
258
259
260
261
262
263
264
265
266
267
268
269
270
271
272
273
274
275
276
277
278
279
280
281
282
283
284
285
286
287
288
289
290
291
292
293
294
295
296
297
298
299
300

Flow balancing and pumping





Guide to completing the pre-connection enquiry form

This form should be completed by applicants enquiring about the feasibility of a water and/or wastewater connection to Irish Water infrastructure.

The Irish Water Codes of Practice are available at www.water.ie for reference.

Section A | Applicant Details

- Question 1:** This question requires the applicant or company enquiring about the feasibility of a connection to identify themselves, their postal address, and to provide their contact details.
- Question 2:** If the applicant has employed a consulting engineer or an agent to manage the enquiry on their behalf, the agent's address and contact details should be recorded here.
- Question 3:** Please indicate whether it is the applicant or the agent who should receive future correspondence in relation to the enquiry.

Section B | Site details

- Question 4:** This is the address of the site requiring the water/wastewater service connection and for which this enquiry is being made.
- Question 5:** Please provide the Irish Grid co-ordinates of the proposed site. Irish grid positions on maps are expressed in two dimensions as Eastings (E or X) and Northings (N or Y) relative to an origin. You will find these coordinates on your Ordnance Survey map which is required to be submitted with an application.
- Question 6:** Please identify the Local Authority that is or will be dealing with your planning application, for example Cork City Council.
- Question 7:** Please indicate if planning permission has been granted for this application, and if so, please provide the planning permission reference number.

Section C | Development details

- Question 8:** Please specify the number of different property/premises types by filling in the tables provided.
- Question 9:** Please indicate the approximate commencement date of works on the development.
- Question 10:** Please indicate if a phased building approach is to be adopted when developing the site. If so, please provide details of the phase master-plan and the proposed variation in water demand/wastewater discharge as a result of the phasing of the development.
- Question 11:** Please indicate the type of connection required by ticking the appropriate box and proceed to complete the appropriate section or sections.

Section D | Water connection and demand details

- Question 12:** Please indicate if a water connection already exists for this site.
- Question 12.1:** Please indicate if this enquiry concerns an additional connection to one already installed on the site.
- Question 12.2:** Please indicate if you are proposing to upgrade the water connection to facilitate an increase in water demand. Irish Water will determine what impact this will have on our infrastructure.
- Question 13:** Please indicate the approximate date that the proposed connection to the water infrastructure will be required.
- Question 14:** Please indicate what diameter of water connection is required to service this development.
- Question 15:** Please indicate if more than one connection is required to service this development. Please note that the connection size provided may be used to determine the connection charge.
- Question 16:** If this connection enquiry concerns a business premises, please provide calculations for the water demand and include your calculations on the calculation sheet provided. Business premises include shops, offices, hotels, schools, etc. Demand rates (peak and average) are site specific. Average demand is the total daily volume divided by a 24-hour time period and expressed in litres per second (l/s). For design purposes, please refer to the Irish Water Codes of Practice for Water Infrastructure.

- Question 17:** If this connection enquiry is for an industrial premises, please calculate the water demand and include your calculations on the calculation sheet provided. Demand rates (peak and average) are site specific. Average demand is the total daily volume divided by a 24-hour time period and expressed in litres per second (l/s). The peak demand for sizing of the pipe network will be as per the specific business production requirements. For design purposes, please refer to the Irish Water Codes of Practice for Water Infrastructure.
- Question 18:** Please specify the ground level at the location where connection to the public water mains will be made. This is required in order to determine if there is sufficient pressure in the existing water infrastructure to serve your proposed development. Levels should be quoted in metres relative to Malin Head Ordnance Datum.
- Question 19:** Please specify the highest finished floor level on site. This is required in order to determine if there is sufficient pressure in the existing water infrastructure to serve your proposed development. Levels should be quoted in metres relative to Malin Head Ordnance Datum.
- Question 20:** If storage is required, water storage capacity of 24-hour water demand must usually be provided at the proposed site. In some cases, 24-hour storage capacity may not be required, for example 24-hour storage for a domestic house would be provided in an attic storage tank. Please calculate the 24-hour water storage requirements and include your calculations on the attached sheet provided. Please also confirm that on-site storage is being provided by ticking the appropriate box.
- Question 21:** The water supply system shall be designed and constructed to reliably convey the water flows that are required of the development including fire flow requirements by the Fire Authority. The Fire Authority will provide the requirement for fire flow rates that the water supply system will have to carry. Please note that while flows in excess of your required demand may be achieved in the Irish Water network and could be utilised in the event of a fire, Irish Water cannot guarantee a flow rate to meet your fire flow requirement. To guarantee a flow to meet the Fire Authority requirements, you should provide adequate fire storage capacity within your development. Please include your calculations on the attached sheet provided, and further provide confirmation of the Fire Authority requirements.
- Question 22:** Please identify proposed additional water supply sources, that is, do you intend to connect to the public water mains or the public mains and supplement from other sources? If supplementing public water supply with a supply from another source, please provide details as to how the potable water supply is to be protected from cross contamination at the premises.

Section E | Wastewater connection and discharge details

- Question 23:** Please indicate if a wastewater connection to a public sewer already exists for this site.
- Question 23.1:** Please indicate if this enquiry relates to an additional wastewater connection to one already installed.
- Question 23.2:** Please indicate if you are proposing to upgrade the wastewater connection to facilitate an increased discharge. Irish Water will determine what impact this will have on our infrastructure.
- Question 24:** Please specify the approximate date that the proposed connection to the wastewater infrastructure will be required.
- Question 25:** Please indicate what diameter of wastewater connection is required to service this development.
- Question 26:** Please indicate if more than one connection is required to service this development. Please indicate number required.
- Question 27:** If this enquiry relates to a business premises, please provide calculations for the wastewater discharge and include your calculations on the attached sheet provided. Business premises include shops, offices, hotels, schools, etc. Discharge rates (peak and average) are site specific. Average discharge is the total daily volume divided by a 24-hour time period and expressed in litres per second (l/s). For design purposes, please refer to the Irish Water Codes of Practice for Wastewater Infrastructure.
- Question 28:** If this enquiry relates to an industrial premises, please provide calculations for the wastewater discharge and include your calculations on the calculation sheet provided. Discharge rates (peak and average) are site specific. Average discharge is the total daily volume divided by a 24-hour time period and expressed in litres per second (l/s). The peak discharge for sizing of the pipe network will be as per the specific business production requirements. For design purposes, please refer to the Irish Water Codes of Practice for Wastewater Infrastructure.

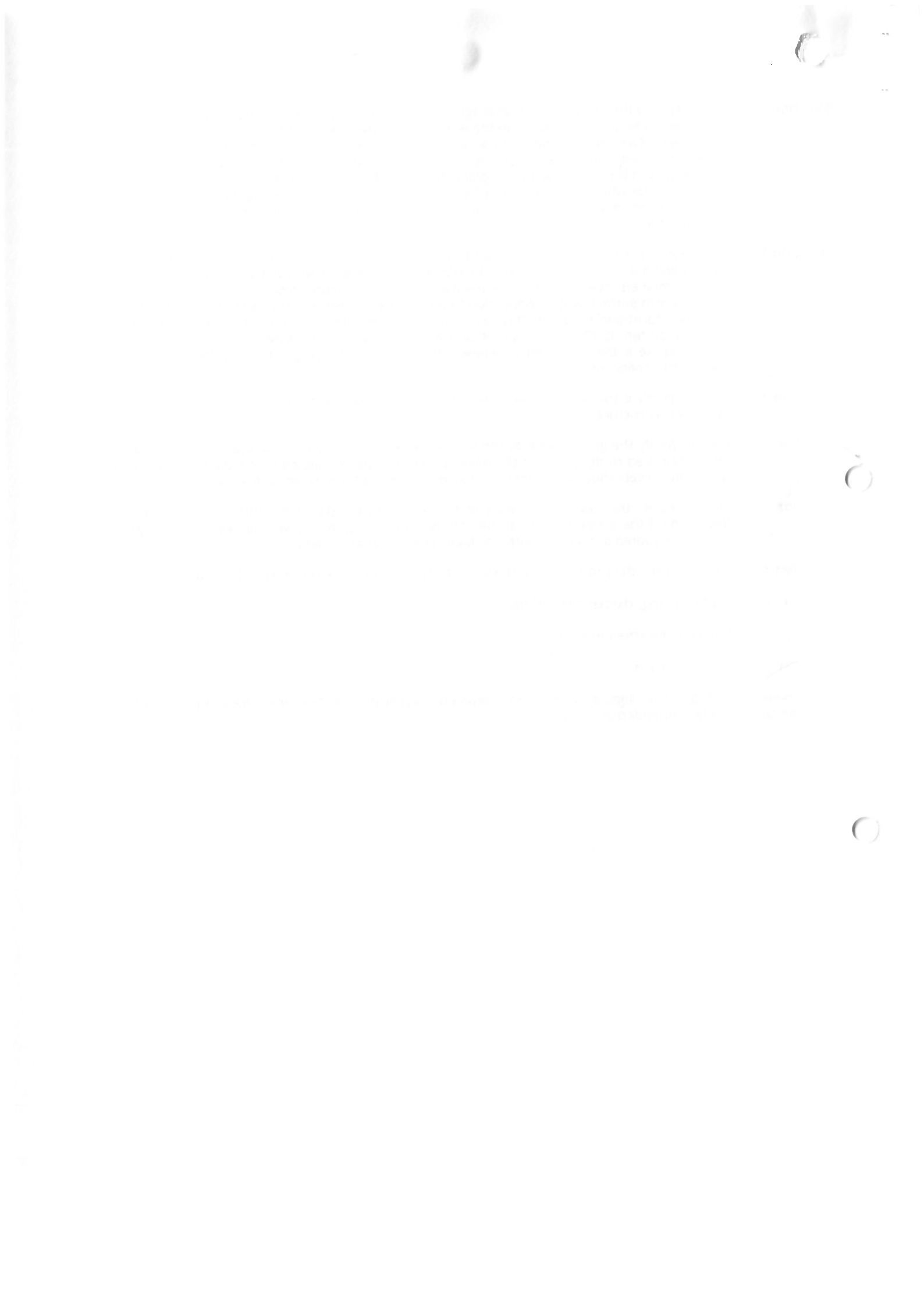
- Question 29:** Please specify the maximum and average concentrations and the maximum daily load of each of the wastewater characteristics listed in the wastewater organic load table (if not domestic effluent), and also specify if any other significant concentrations are expected in the effluent. Please complete the table and provide additional supporting documentation if relevant. Note that the concentration shall be in mg/l and the load shall be in kg/day. Note that for business premises (shops, offices, schools, hotels, etc.) for which only domestic effluent will be discharged (excluding discharge from canteens/restaurants which would require a Trade Effluent Discharge licence), there is no need to complete this question.
- Question 30:** In exceptional circumstances, such as brownfield sites, where the only practical outlet for storm/surface water is to a combined sewer, Irish Water will consider permitting a restricted attenuated flow to the combined sewer. Storm/surface water will only be accepted from brownfield sites that already have a storm/surface water connection to a combined sewer and the applicant must demonstrate how the storm/surface water flow from the proposed site is minimised using sustainable urban drainage system (SUDS). This type of connection will only be considered on a case by case basis. Please advise if the proposed development intends discharging surface water to the combined wastewater collection system.
- Question 31:** Please specify if the development needs to pump its wastewater discharge to gain access to Irish Water infrastructure.
- Question 32:** Please specify the ground level at the location where connection to the public sewer will be made. This is required to determine if the development can be connected to the public sewer via gravity discharge. Levels should be quoted in metres relative to Malin Head Ordnance Datum.
- Question 33:** Please specify the lowest floor level of the proposed development. This is required in order to determine if the development can be connected to the public sewer via gravity discharge. Levels should be quoted in metres relative to Malin Head Ordnance Datum.
- Question 34:** Please specify the proposed invert level of the pipe exiting the property to the public road.

Section F | Supporting documentation

Please provide additional information as listed.

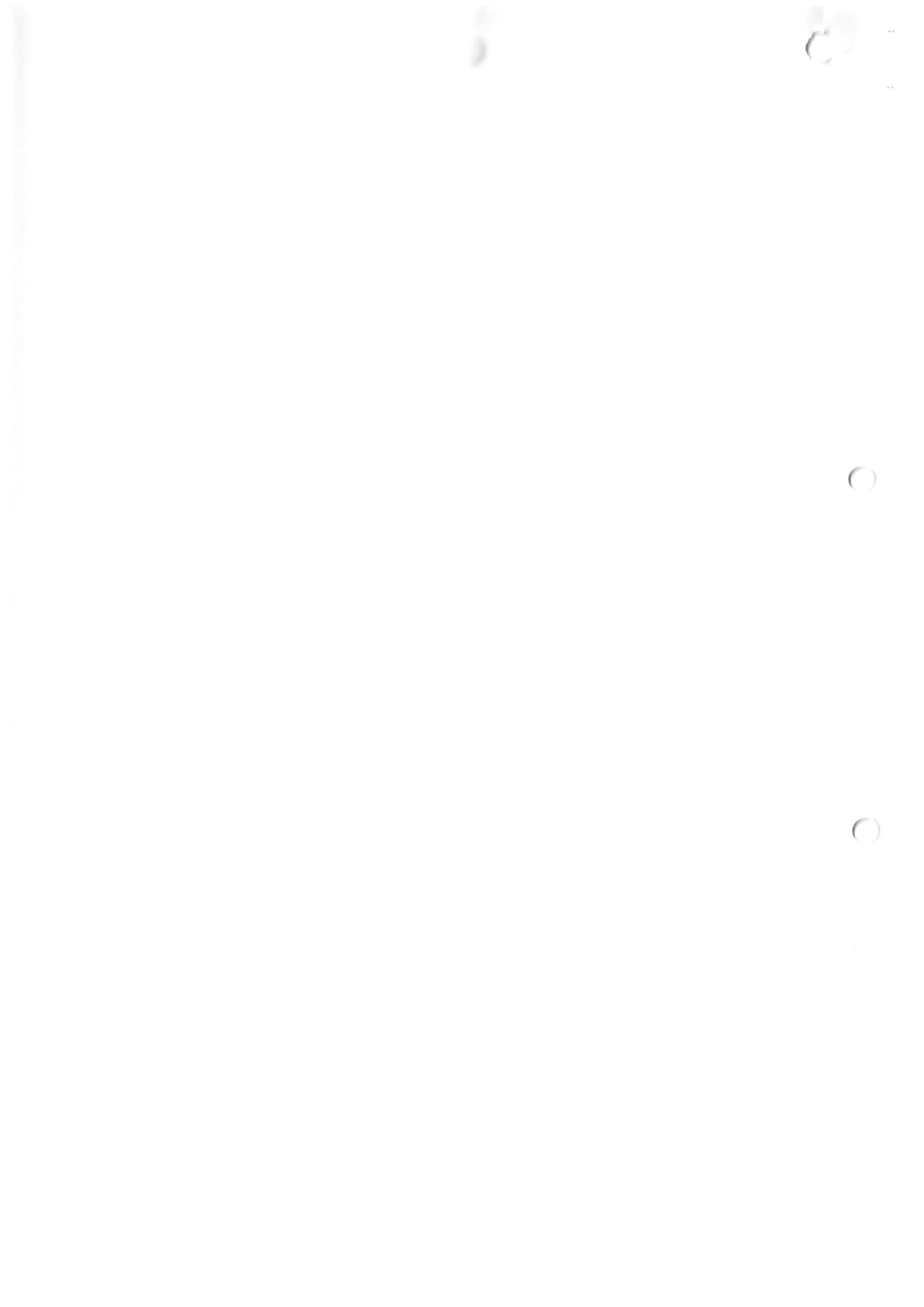
Section G | Declaration

Please review the declaration, sign, and return the completed application form to Irish Water by email or by post using the contact details provided in Section G.



Notes

A large, empty rectangular box with a thin black border, occupying most of the page. It is intended for handwritten notes.



Notes

Note 1:

**Chief Assistant Technical Services Officer ,
Health Service Executive,
Estates West.
Holland Road.
National Technology Park,
Limerick**



D. Fallon
Consulting Engineers
Dublin - Galway

Appendix A:

Site Location Map

Site Layout Plan

G2029DR0002D01 Proposed Foul Drainage Layout

G2029DR0003D01 Proposed Watermain Layout

FKM Fallon Limited trading as D Fallon Consulting Engineers, registered in Ireland No.543932

Dublin Address: Lis Cara Business Centre, 51-52 Fitzwilliam Square West, Dublin 2. **T:** +353 (0)1 5394100

Galway Address: Office 25 Calbro Court, Tuam Road, Galway. **T:** +353 (0)91 380792

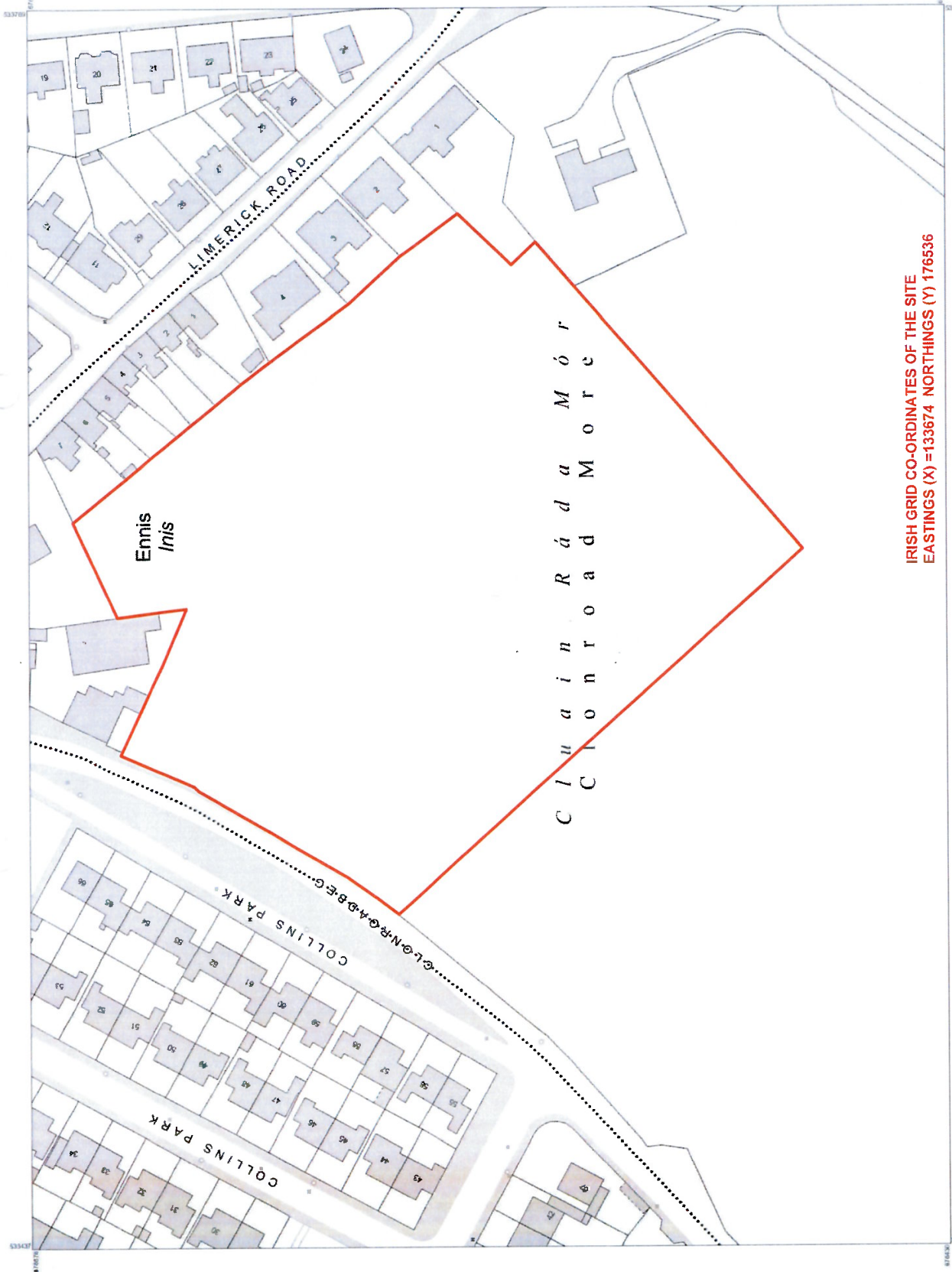
E: info@falloneng.com **W:** falloneng.com

Damien Fallon on LinkedIn. **LinkedIn**



QUALITY
ISO 9001:2015
NSAI Certified





IRISH GRID CO-ORDINATES OF THE SITE
 EASTINGS (X) = 133674 NORTHINGS (Y) 176536

REV	DESCRIPTION	DWG.	DATE

DATE OF ISSUE	28.10.2021
SCALE	1:100 @ A3
DRAWN BY	Neil Mullin
APPROVED BY	Caral Maguire
SP. NO.	40345
DWG.	ENN-MRL VDA-ZZ-DR-A-0051

Project	PROPOSED 100 BED COMMUNITY NURSING HOME IN ENNIS, Co. CLARE
Title	LOCATION MAP

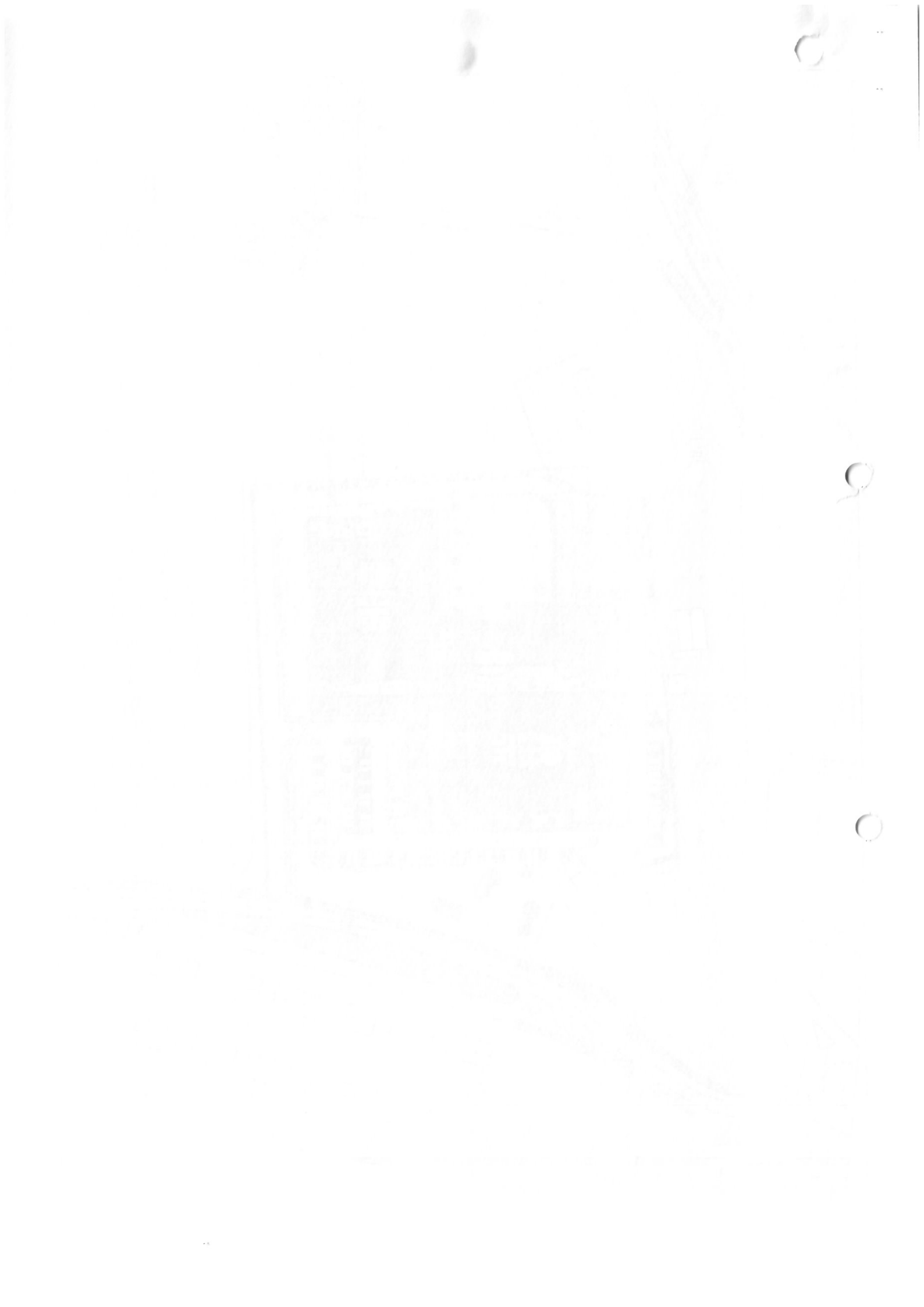
vanDijk Architects
 Mill Street
 Dundalk, Co. Louth
 T: +353 42 9354466
 E: info@vandijkarchitects.com
 www.vandijkarchitects.com

Milligan Reside Larkin
 56 Armaigh Road, Newry
 Co. Down BT35 6DN
 T: 028 30 263766
 F: 028 30 261035
 E: design@mrlarch.co.uk

MRL
DIJK
 vanDijk
 ARCHITECTS

HS
 Kollínneamhach na Scribhne-Snáimé
 Health Service Executive





1. This drawing is a preliminary design and is not to be used for construction without the approval of the engineer.

2. The engineer is not responsible for the accuracy of the information provided by the client or other sources.

3. The engineer is not responsible for the accuracy of the information provided by the client or other sources.

4. The engineer is not responsible for the accuracy of the information provided by the client or other sources.

5. The engineer is not responsible for the accuracy of the information provided by the client or other sources.

6. The engineer is not responsible for the accuracy of the information provided by the client or other sources.


7. The engineer is not responsible for the accuracy of the information provided by the client or other sources.

8. The engineer is not responsible for the accuracy of the information provided by the client or other sources.

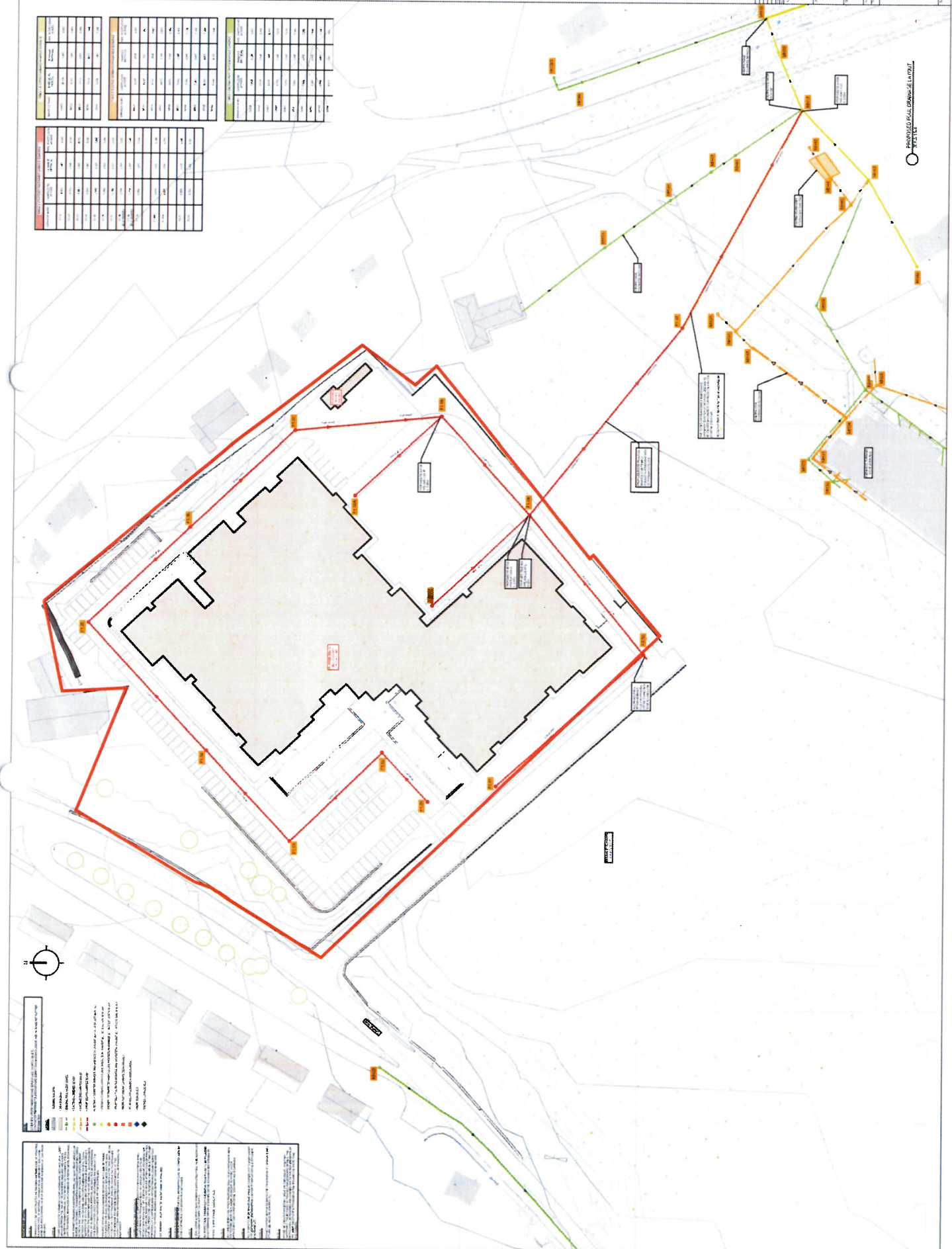
9. The engineer is not responsible for the accuracy of the information provided by the client or other sources.

10. The engineer is not responsible for the accuracy of the information provided by the client or other sources.

DRAFT

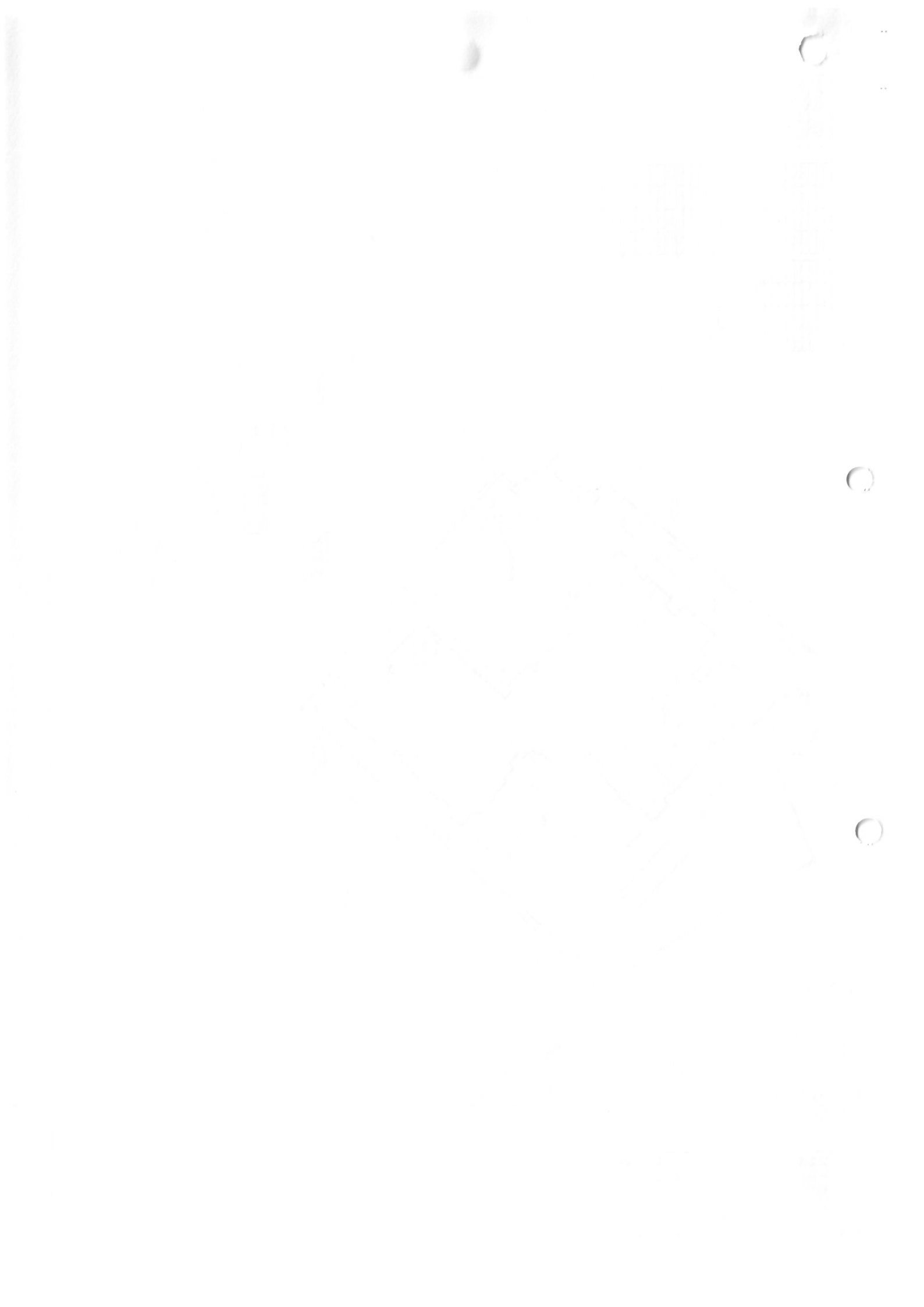
 D. Fallon Professional Engineer License No. 10000 State of California	
Project Name: _____ Client: _____ Date: _____	Drawing No.: _____ Revision: _____ Scale: _____

Item	Description	Quantity	Unit	Notes
1
2
3
4
5
6
7
8
9
10



NOTES:

1. All utility lines shown are based on existing records and field surveys.
2. The utility lines shown are not to be used for construction without the approval of the engineer.
3. The utility lines shown are not to be used for construction without the approval of the engineer.
4. The utility lines shown are not to be used for construction without the approval of the engineer.
5. The utility lines shown are not to be used for construction without the approval of the engineer.
6. The utility lines shown are not to be used for construction without the approval of the engineer.
7. The utility lines shown are not to be used for construction without the approval of the engineer.
8. The utility lines shown are not to be used for construction without the approval of the engineer.
9. The utility lines shown are not to be used for construction without the approval of the engineer.
10. The utility lines shown are not to be used for construction without the approval of the engineer.



1. This drawing is a preliminary design and is not to be used for construction. It is subject to change without notice.
 2. The design is based on the information provided by the client and is not to be used for any other purpose.
 3. The design is based on the current standards and regulations in force at the time of the design.
 4. The design is based on the current standards and regulations in force at the time of the design.
 5. The design is based on the current standards and regulations in force at the time of the design.
 6. The design is based on the current standards and regulations in force at the time of the design.
 7. The design is based on the current standards and regulations in force at the time of the design.
 8. The design is based on the current standards and regulations in force at the time of the design.
 9. The design is based on the current standards and regulations in force at the time of the design.
 10. The design is based on the current standards and regulations in force at the time of the design.

DRAFT

Project Name	Project No.	Scale
Client Name	Client No.	Client Address
Project Location	Project Date	Project Status
Project Manager	Project Engineer	Project Designer
Project Checker	Project Approver	Project Sign-off

OCEANIC WATERMAIN LTD.
 1000 WESTERN AVENUE
 SUITE 100
 VANCOUVER, BC V6V 1C6
 TEL: 604-271-1111
 FAX: 604-271-1112
 WWW.OCEANICWATERMAIN.COM



LEGEND

Symbol	Description
Blue line with arrow	Watermain
Red line	Watermain
Black line	Watermain
Red dashed circle	Service Area
Blue square	Watermain
Red square	Watermain
Black square	Watermain
Blue circle	Watermain
Red circle	Watermain
Black circle	Watermain

1. This drawing is a preliminary design and is not to be used for construction. It is subject to change without notice.
 2. The design is based on the information provided by the client and is not to be used for any other purpose.
 3. The design is based on the current standards and regulations in force at the time of the design.
 4. The design is based on the current standards and regulations in force at the time of the design.
 5. The design is based on the current standards and regulations in force at the time of the design.
 6. The design is based on the current standards and regulations in force at the time of the design.
 7. The design is based on the current standards and regulations in force at the time of the design.
 8. The design is based on the current standards and regulations in force at the time of the design.
 9. The design is based on the current standards and regulations in force at the time of the design.
 10. The design is based on the current standards and regulations in force at the time of the design.





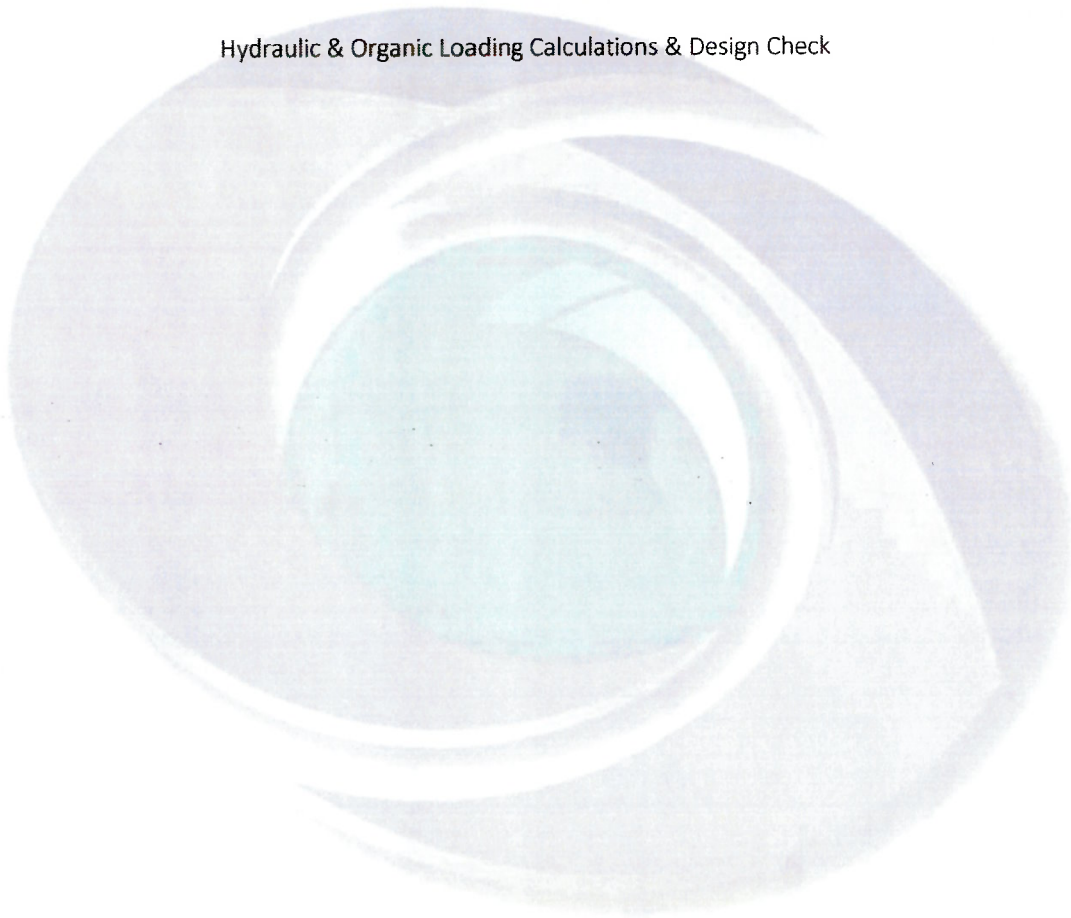
D. Fallon

Consulting Engineers

Dublin - Galway

Appendix B:

Hydraulic & Organic Loading Calculations & Design Check



FKM Fallon Limited trading as D Fallon Consulting Engineers, registered in Ireland No.543932

Dublin Address: Lis Cara Business Centre, 51-52 Fitzwilliam Square West, Dublin 2. **T:** +353 (0)1 5394100

Galway Address: Office 25 Calbro Court, Tuam Road, Galway. **T:** +353 (0)91 380792

E: info@falloneng.com **W:** falloneng.com

Damien Fallon on LinkedIn. [LinkedIn](#)



**ENGINEERS
IRELAND**



QUALITY
ISO 9001:2015
NSAI Certified

2.0 FW Loading Calculations

A) Average

Source	No.	Hydraulic Loading			Organic Loading			
		Litres/ head / day	Total Hydraulic Loading (litres/day)	Equip. PE (Total Hyd. load/180)	Max. Flow rate based on 6 DWF (litres/sec)	Loading g/ head/ day	Total Organic, Loading (g/day)	Equip PE (=Total organic load/60)
Staff	90	60	5,400	30.00	0.38	30	2,700	45.00
Residents	125	350	43,750	243.06	3.04	60	7,500	125.00
Visitors	35	30	1,050	5.83	0.07	10	350	5.83
Total	250	--	50,200	278.89	3.49		10,550	175.83

B) Peak Demand (Average + 25%)

Source	No.	Hydraulic Loading			Organic Loading			
		Litres/ head / day	Total Hydraulic Loading (litres/day)	Equip. PE (Total Hyd. load/180)	Max. Flow rate based on 6 DWF (litres/sec)	Loading g/ head/ day	Total Organic, Loading (g/day)	Equip PE (=Total organic load/60)
Staff	90	75	6,750	37.50	0.47	37.5	3,375	56.25
Residents	125	437.5	54,688	303.82	3.80	75	9,375	156.25
Visitors	35	37.5	1,313	7.29	0.09	12.5	438	7.29
Total	250	--	62,750	348.61	4.36		13,188	219.79

Year	Month	Day	Time	Location	Remarks
1950	1	1	10:00	...	...
1950	1	2	10:00	...	...
1950	1	3	10:00	...	...
1950	1	4	10:00	...	...
1950	1	5	10:00	...	...
1950	1	6	10:00	...	...
1950	1	7	10:00	...	...
1950	1	8	10:00	...	...
1950	1	9	10:00	...	...
1950	1	10	10:00	...	...
1950	1	11	10:00	...	...
1950	1	12	10:00	...	...
1950	1	13	10:00	...	...
1950	1	14	10:00	...	...
1950	1	15	10:00	...	...
1950	1	16	10:00	...	...
1950	1	17	10:00	...	...
1950	1	18	10:00	...	...
1950	1	19	10:00	...	...
1950	1	20	10:00	...	...
1950	1	21	10:00	...	...
1950	1	22	10:00	...	...
1950	1	23	10:00	...	...
1950	1	24	10:00	...	...
1950	1	25	10:00	...	...
1950	1	26	10:00	...	...
1950	1	27	10:00	...	...
1950	1	28	10:00	...	...
1950	1	29	10:00	...	...
1950	1	30	10:00	...	...
1950	1	31	10:00	...	...

Year	Month	Day	Time	Location	Remarks
1950	1	1	10:00	...	...
1950	1	2	10:00	...	...
1950	1	3	10:00	...	...
1950	1	4	10:00	...	...
1950	1	5	10:00	...	...
1950	1	6	10:00	...	...
1950	1	7	10:00	...	...
1950	1	8	10:00	...	...
1950	1	9	10:00	...	...
1950	1	10	10:00	...	...
1950	1	11	10:00	...	...
1950	1	12	10:00	...	...
1950	1	13	10:00	...	...
1950	1	14	10:00	...	...
1950	1	15	10:00	...	...
1950	1	16	10:00	...	...
1950	1	17	10:00	...	...
1950	1	18	10:00	...	...
1950	1	19	10:00	...	...
1950	1	20	10:00	...	...
1950	1	21	10:00	...	...
1950	1	22	10:00	...	...
1950	1	23	10:00	...	...
1950	1	24	10:00	...	...
1950	1	25	10:00	...	...
1950	1	26	10:00	...	...
1950	1	27	10:00	...	...
1950	1	28	10:00	...	...
1950	1	29	10:00	...	...
1950	1	30	10:00	...	...
1950	1	31	10:00	...	...

Proposed Foulwater Pipeline Run (F1.01-F1.10)												
USMH	Drop MH	USIL	DSMH	Drop MH	DSIL	Chainage	Length	Grade	Pipe Size	Roughness	Pipe Capacity	Pipe Velocity
Ref		m	Ref		m	m	m		mm	mm	l/s	m/s
F1.01	No	9.320	F1.01	No	9.320	0.000						
F1.02	No	9.145	F1.02	No	9.145	21.000	21.000	120	150	0.15	18.86	1.07
F1.03	No	8.935	F1.03	No	8.935	61.500	40.500	193	225	0.15	43.03	1.08
F1.04	No	8.745	F1.04	No	8.745	99.750	38.250	201	225	0.15	42.13	1.06
F1.05	No	8.465	F1.05	No	8.465	154.250	54.500	195	225	0.15	42.80	1.08
F1.06	No	8.245	F1.06	No	8.245	197.750	43.500	198	225	0.15	42.46	1.07
F1.07	No	8.025	F1.07	No	8.025	242.250	44.500	202	225	0.15	42.02	1.06
F1.08	Yes	7.800	F1.08	Yes	7.800	288.000	45.750	203	225	0.15	41.92	1.05
F1.09	Yes	7.600	F1.09	Yes	7.600	328.750	40.750	204	225	0.15	41.81	1.05
F1.10	No	7.225	F1.10	No	7.225	403.750	75.000	200	225	0.15	42.24	1.06
F1.10	No	7.225	MH12	No	6.850	480.750	77.000	205	225	0.15	41.70	1.05
<i>Note: Refer to Existing Drainage Layout G2029DR0001, Proposed Development assumes tie-in at MH13 Invert Level = 6.850m</i>												
Proposed Foulwater Pipeline Run (F1.08A-F1.08)												
USMH	Drop	USIL	DSMH	Drop	DSIL	Chainage	Length	Grade	Pipe Size	Roughness	Pipe Capacity	Pipe Velocity
Ref		m	Ref		m	m	m		mm	mm	l/s	m/s
F1.08A	No	9.200	F1.08A	No	9.200	0.000						
F1.08A	No	9.200	F1.08	Yes	8.800	36.000	36.000	90	150	0.15	21.89	1.24
F1.08A			F1.08	Yes	7.800							
<i>Note: Refer to Proposed Drainage Layout G2029DR0002, assumes tie-in at F1.08 Invert Level = 8.800m (Drop Manhole Required)</i>												
Proposed Foulwater Pipeline Run (F1.09A-F1.09)												
USMH	Drop	USIL	DSMH	Drop	DSIL	Chainage	Length	Grade	Pipe Size	Roughness	Pipe Capacity	Pipe Velocity
Ref		m	Ref		m	m	m		mm	mm	l/s	m/s
F1.09A	No	9.750	F1.09A	No	9.750	0.000						
F1.09A	No	9.750	F1.09	Yes	9.350	40.500	40.500	101	150	0.15	20.62	1.17
F1.09A			F1.09	Yes	7.600							
<i>Note: Refer to Proposed Drainage Layout G2029DR0002, assumes tie-in at F1.09 Invert Level = 9.350m (Drop Manhole Required)</i>												
Proposed Foulwater Pipeline Run (F2.01-F1.09)												
USMH	Drop	USIL	DSMH	Drop	DSIL	Chainage	Length	Grade	Pipe Size	Roughness	Pipe Capacity	Pipe Velocity
Ref		m	Ref		m	m	m		mm	mm	l/s	m/s
F2.01	No	9.625	F2.01	No	9.625	0.000						
F2.01	No	9.625	F2.02	No	9.325	61.500	61.500	205	225	0.15	41.70	1.05
F2.02	No	9.325	F1.09	Yes	9.025	118.500	57.000	190	225	0.15	43.38	1.09
F2.02			F1.09	Yes	7.600							
<i>Note: Refer to Proposed Drainage Layout G2029DR0002, assumes tie-in at F1.09 Invert Level = 9.025m (Drop Manhole Required)</i>												



Pre-Connection Enquiry CDS21008799 - Turnpike Road, Ennis, Clare

Assessment Period: 13/12/21 – 29/04/22

The Uisce Eireann/Irish Water assessment process (desktop analysis) of capacity currently available in the Uisce Eireann/Irish Water networks involves input from three stakeholders.

1. Local Authority Water Services;
2. Uisce Eireann/Irish Water Connections & Developer Services (CDS) Design team;
3. Uisce Eireann/Irish Water Asset Planning.

1. Local Authority Water Services

Water Assessment

From: Conor Marrinan

Sent: 21 December 2021 16:05

To: Deirdre O'Keeffe

Subject: RE: CDS21008799 PCE for water and Waste water for HSE Midwest, Turnpike Road, Ennis, Co. Clare - 100 bed Community Nursing Unit

Hi Deirdre,

Application filled out and saved in 365.

Connection is feasible.

“Magmeter required to IW standards at connection point to public network”

Thanks,

Conor

Conor Marrinan

Executive Engineer

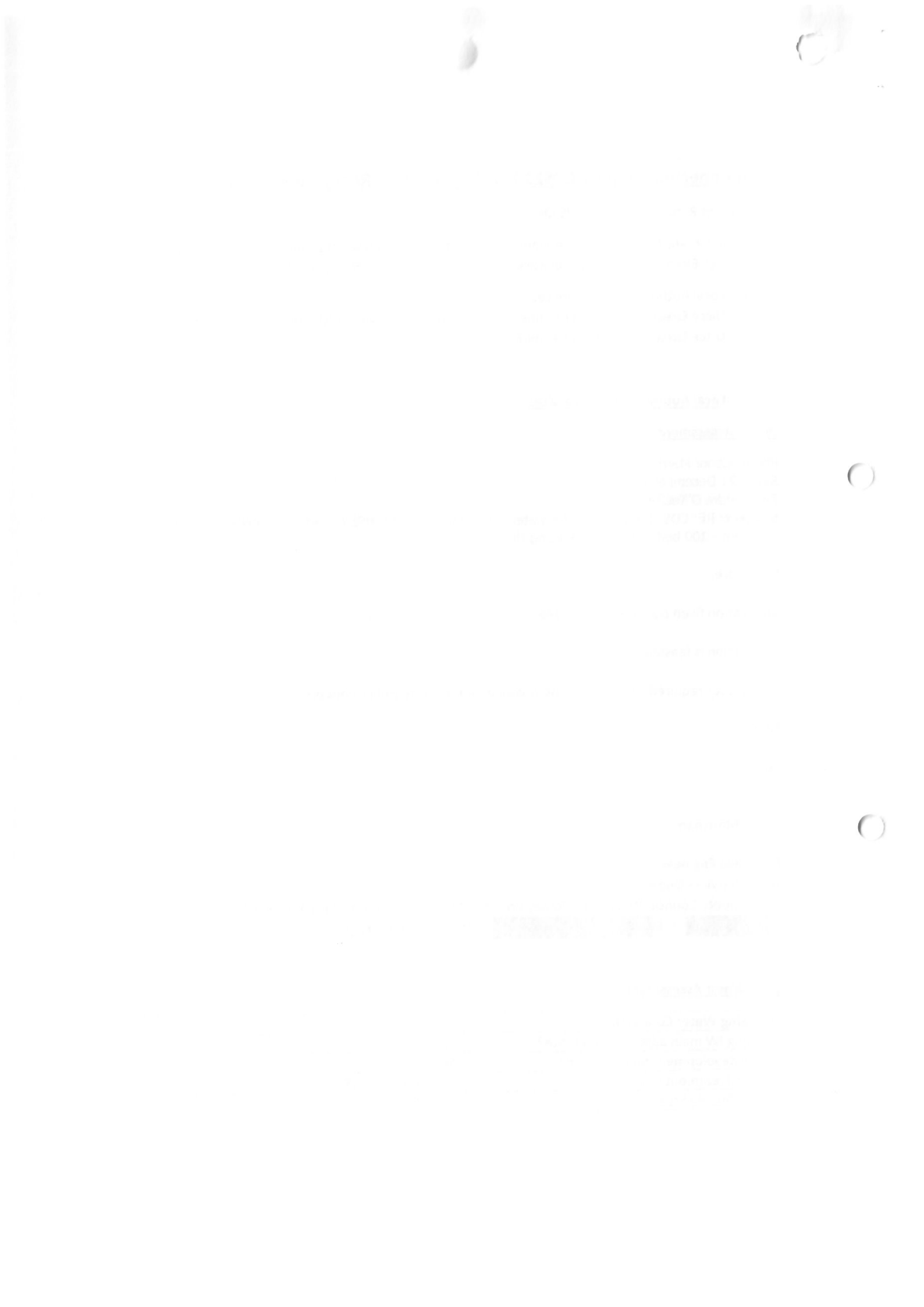
Water Services Department

Clare County Council, Waterpark House, Drumbiggle Road, Ennis, Co. Clare, V95 N1NR

T: [REDACTED] | E: [REDACTED] | W: www.clarecoco.ie

D365 Water Assessment

Drinking Water Connection	
Existing IW main adjacent to the site?	Yes
Is the development multi-phased?	No
Water Treatment Plant	DRUMCLIFFE WTP
Water Supply Scheme	Ennis PWS



Infrastructure Assessment	
Upgrade to WTP required for development?	No
Upgrade to water network reqd. for development?	Yes
Constraints and potential solutions (IW Network)	Magmeter required at connection point to IW standards
Existing IW water asset within the site	No

Assessment Summary	
Type of Development	Business Connection
Existing IW main adjacent to the site?	Yes
Are Water Infrastructure upgrades required?	Yes
Impacts to IW Water Infrastructure	No
Outcome	Refer to CDS

Wastewater Assessment

From: Patrick Tiernan

Sent: 31 January 2022 16:40

To: Deirdre O'Keefe

Subject: RE: CDS21008799 PCE for water and Waste water for HSE Midwest, Turnpike Road, Ennis, Co. Clare - 100 bed Community Nursing Unit

Deirdre,

Waste water section is complete.

Paddy

D365 Wastewater Assessment

Wastewater Connection	
Existing IW sewer adjacent to the site?	Yes
Existing mains dia. for connection	>300
Material of existing wastewater sewer	Concrete
Is the development multi-phased?	No
Wastewater Treatment Plant	Clareabbey WWTP

Infrastructure Assessment	
Upgrade to WWTP required for development?	No
Upgrade to IW network required for development?	Yes
Constraints and potential solutions (IW Network)	Westfields Pump Station under pressure during inclement weather. Foul network also floods in Toberteascaín during inclement weather. Proposed solutions - upgrade Westfields PS and/or new main foul sewer direct from Clare Road to Westfields PS. A possibility also exists



	to pump Kildysart Cross PS direct to Clareabbey WwTP. Currently Kildysart cross pumps to Westfields before being pumped on again to Clareabbey WwTP. Pumping directly from Kildysart cross to Clareabbey would relieve significant pressure at Westfields.
Intent to discharge surface water	No
Existing IW water/wastewater asset within the site	No
Diversion required for development?	No
Provide details on Impact	Existing sewer network under pressure especially in times of inclement weather. Westfields pump station struggles with incoming flows during inclement weather. Inclement weather also leads to sewage flooding in Tobertascain due to links between storm and foul network
Potential impact on IW infrastructure?	Yes

Assessment Summary	
Type of Development	Business Connection
Existing IW sewer adjacent to the site?	Yes
Wastewater Infrastructure upgrades required?	Yes
Surface water to be discharged to the IW network?	No
Impacts to IW Wastewater Infrastructure	Yes
Outcome	Refer to CDS

The first part of the document discusses the importance of maintaining accurate records of all transactions. It emphasizes that every entry should be supported by a valid receipt or invoice. This not only helps in tracking expenses but also ensures compliance with tax regulations.

In the second section, the author provides a detailed breakdown of the company's financial performance over the last quarter. This includes a comparison of actual results against budgeted figures, highlighting areas of both strength and concern.

The third section outlines the strategic initiatives planned for the upcoming year. These include expanding into new markets, investing in research and development, and optimizing operational efficiency. The goal is to achieve a 15% increase in revenue while keeping costs under control.

Category	Q1 Actual	Q1 Budget	Q2 Actual	Q2 Budget
Revenue	\$1,200,000	\$1,150,000	\$1,350,000	\$1,300,000
Operating Expenses	\$800,000	\$820,000	\$850,000	\$830,000
Operating Profit	\$400,000	\$330,000	\$500,000	\$470,000
Net Income	\$300,000	\$250,000	\$380,000	\$350,000

The following table provides a summary of the key financial metrics discussed in the report. It shows a consistent upward trend in both revenue and profit, indicating a strong performance relative to the budget.

Metric	Target	Actual
Revenue Growth	+10%	+18%
Operating Profit Margin	35%	37%
Net Income	\$280,000	\$380,000

The data indicates that the company has successfully exceeded its revenue targets and improved its profit margins. This is primarily due to increased sales volume and better cost management. However, there are still areas for improvement, particularly in controlling operating expenses.

The management team is committed to continuing this growth trajectory and will implement the following actions to address the identified challenges:

- Review and optimize the supply chain to reduce procurement costs.
- Enhance marketing efforts to attract new customers and retain existing ones.
- Invest in employee training to improve productivity and reduce turnover.

2. Uisce Eireann/Irish Water Connections & Developer Services (CDS) Design team

Constraints identified in the Local Authority Water Services Assessment. CDS assess the proposed connection and the Constraints identified to determine if further assessment is required by Asset Planning.

Water Treatment Plant Capacity Register assessed:

Local Authority	Water Supply Zone Name	WSE Code	Plant Name (Local Name)	2016 Production Capacity (m ³ /day)	Abstraction Safe Reliable Yield (m ³ /day)	Daily Production (m ³ /day)	Available Water production (m ³ /day)	Standard Housing Units (Residential)
Clare	Ennis PWS	0400PUB1029	Duncliffe WTP	18000	18000	14800	1200	1225.81

Wastewater Treatment Plant Capacity Register assessed:

Uisce Eireann **Settlements with Waste Water Discharge Authorisations - Wastewater Treatment Capacity** **29th April 2020**
Waste Water Discharge Licences (WWDL) and Certificates of Authorisation (CoA)

Region	County	Settlement	Census pop. (2016)	Wastewater Treatment Plant (WWTP)	Reg #	Serves other areas?	WWTP Capacity (PE)		Load (PE) 2019	Headroom (PE)		Current project completion year
							Today	Upon works completion		WWDL ELV Capability	UWW Standards Capability (not WWDL ELVs)	
5	Clare	Ennis	incl.	Clareabbey WWTP	000199	Yes	6,000	Not yet defined	4,742	0	1,258	Post 2024

Headroom available at the WWTP in 2019 in terms of population equivalents based on available capacity now or by completion of a project by 2022 (where relevant)

Green = spare capacity available
Amber - potential spare capacity. WWTP currently not compliant with Waste Water Discharge Licence emission limit values but is capable of achieving at least UWW standards. Potential availability of capacity in this case would be dependent on any additional load not resulting in a significant breach of the combined approach as set out in Regulation 43 of the Waste Water Discharge (Authorisation) Regulations 2007.

Capital Needs Assessment - Treatment	
Referral to Water Treatment Required	No
Referral to Wastewater Treatment Required	Yes
Reason for Referral (Wastewater treatment)	Constraints Identified

Capital Needs Assessment - Network	
Referral to Water Networks Required	Yes
Reason for Referral (Water Networks)	Constraints Identified
Referral to Wastewater Networks Required	Yes
Reason for Referral (Wastewater Network)	Constraints Identified

1. The first part of the document discusses the importance of maintaining accurate records of all transactions. It emphasizes that this is crucial for the company's financial health and for providing reliable information to stakeholders.

2. The second part of the document outlines the specific procedures for recording transactions. It details the steps from identifying a transaction to entering it into the accounting system, ensuring that all necessary details are captured.

3. The third part of the document discusses the role of the accounting department in monitoring and controlling the company's financial performance. It highlights the importance of regular reviews and the use of financial ratios to assess the company's position.

4. The fourth part of the document concludes by summarizing the key points discussed and reiterating the importance of a strong accounting system for the company's success. It also provides contact information for further assistance.

3. Uisce Eireann/Irish Water Asset Planning

Wastewater Treatment Capacity Assessment	
Upgrade/Extension of the existing WWTP required?	Yes
Provide details on WWTP Works required	Upgrade of the Clonroadmore WWTP* is included in the Irish Water Investment Plan. Project is currently at Feasibility stage. Proposed development can progress ahead of the upgrade to the wastewater treatment plant.
<i>*The LA identified Clareabbey WWTP as the relevant WWTP however Asset Planning confirmed this area is connected to the Clonroadmore collection network which drains to the Clonroadmore WWTP.</i>	

Wastewater Network Assessment	
Extension/upgrade of the existing network Rqd.? WW	Yes
Provide details on WW Net. Assess works reqd.	Extg network has capacity for foul only load from this site. Storm run-off will not be accepted. Developer to provide details of how he is dealing with run-off, and demonstrate that it does not end up in IW sewer away from the site. IW will progress any upgrades on Westfields WWPS directly.

Water Network Assessment	
Extension/upgrade of the existing network Rqd.? DW	No





Alan Armstrong
Office 25,
Calbro Court, Tuam Road,
Galway
H91YKH

Uisce Éireann
Bosca OP 448
Oifig Sheachadta na
Cathrach Theas
Cathair Chorca

29 April 2022

Irish Water
PO Box 448,
South City
Delivery Office,
Cork City.

www.water.ie

Re: CDS21008799 pre-connection enquiry - Subject to contract | Contract denied
Connection for Business Connection of 1 unit(s) at Turnpike Road, Ennis, Clare

Dear Sir/Madam,

Irish Water has reviewed your pre-connection enquiry in relation to a Water & Wastewater connection at Turnpike Road, Ennis, Clare (the **Premises**). Based upon the details you have provided with your pre-connection enquiry and on our desk top analysis of the capacity currently available in the Irish Water network(s) as assessed by Irish Water, we wish to advise you that your proposed connection to the Irish Water network(s) can be facilitated at this moment in time.

SERVICE	OUTCOME OF PRE-CONNECTION ENQUIRY <u>THIS IS NOT A CONNECTION OFFER. YOU MUST APPLY FOR A CONNECTION(S) TO THE IRISH WATER NETWORK(S) IF YOU WISH TO PROCEED.</u>
Water Connection	Feasible without infrastructure upgrade by Irish Water
Wastewater Connection	Feasible without infrastructure upgrade by Irish Water
SITE SPECIFIC COMMENTS	
Water Connection	There is sufficient capacity for the proposed development.
Wastewater Connection	There is sufficient capacity for the proposed development.
The design and construction of the Water & Wastewater pipes and related infrastructure to be installed in this development shall comply with the Irish Water Connections and Developer Services Standard Details and Codes of Practice that are available on the Irish Water website. Irish Water reserves the right to supplement these requirements with Codes of Practice and these will be issued with the connection agreement.	

The first part of the document discusses the importance of maintaining accurate records of all transactions. It emphasizes that every entry should be supported by a valid receipt or invoice. This ensures transparency and allows for easy verification of the data.

In the second section, the author details the various methods used to collect and analyze the data. This includes both manual entry and the use of specialized software tools. The goal is to ensure that the data is both accurate and easy to interpret.

Item	Description	Quantity	Unit Price	Total
1	Office Supplies	10	5.00	50.00
2	Printing Services	5	10.00	50.00
3	Software Licenses	2	25.00	50.00
4	Travel Expenses	1	50.00	50.00
5	Professional Fees	1	50.00	50.00
6	Utilities	1	50.00	50.00
7	Insurance	1	50.00	50.00
8	Marketing	1	50.00	50.00
9	Research	1	50.00	50.00
10	Development	1	50.00	50.00

The final section of the document provides a summary of the findings and conclusions. It highlights the overall accuracy of the data and the effectiveness of the methods used. The author also offers recommendations for future data collection and analysis efforts.

In conclusion, this document serves as a comprehensive guide to data management and analysis. It provides a clear and concise overview of the process, from data collection to final reporting.

The map included below outlines the current Irish Water infrastructure adjacent to your site:



Reproduced from the Ordnance Survey of Ireland by Permission of the Government. License No. 3-3-34

Whilst every care has been taken in its compilation Irish Water gives this information as to the position of its underground network as a general guide only on the strict understanding that it is based on the best available information provided by each Local Authority in Ireland to Irish Water. Irish Water can assume no responsibility for and give no guarantees, undertakings or warranties concerning the accuracy, completeness or up to date nature of the information provided and does not accept any liability whatsoever arising from any errors or omissions. This information should not be relied upon in the event of excavations or any other works being carried out in the vicinity of the Irish Water underground network. The onus is on the parties carrying out excavations or any other works to ensure the exact location of the Irish Water underground network is identified prior to excavations or any other works being carried out. Service connection pipes are not generally shown but their presence should be anticipated.



The following text is extremely faint and illegible, appearing as a series of lines of small characters. It likely contains a description or legend related to the diagram above. The text is arranged in several lines, possibly forming a list or a set of instructions.

General Notes:

- 1) The initial assessment referred to above is carried out taking into account water demand and wastewater discharge volumes and infrastructure details on the date of the assessment. **The availability of capacity may change at any date after this assessment.**
- 2) This feedback does not constitute a contract in whole or in part to provide a connection to any Irish Water infrastructure. All feasibility assessments are subject to the constraints of the Irish Water Capital Investment Plan.
- 3) The feedback provided is subject to a Connection Agreement/contract being signed at a later date.
- 4) A Connection Agreement will be required to commencing the connection works associated with the enquiry this can be applied for at <https://www.water.ie/connections/get-connected/>
- 5) A Connection Agreement cannot be issued until all statutory approvals are successfully in place.
- 6) Irish Water Connection Policy/ Charges can be found at <https://www.water.ie/connections/information/connection-charges/>
- 7) Please note the Confirmation of Feasibility does not extend to your fire flow requirements.
- 8) Irish Water is not responsible for the management or disposal of storm water or ground waters. You are advised to contact the relevant Local Authority to discuss the management or disposal of proposed storm water or ground water discharges
- 9) To access Irish Water Maps email datarequests@water.ie
- 10) All works to the Irish Water infrastructure, including works in the Public Space, shall have to be carried out by Irish Water.

If you have any further questions, please contact Shane Mcmanus from the design team by email to [REDACTED] For further information, visit www.water.ie/connections.

Yours sincerely,



Yvonne Harris

Head of Customer Operations

The first part of the document is a list of items, numbered 1 through 10. Each item is followed by a description. The descriptions are very faint and difficult to read, but they appear to be a list of materials or components.

1. ...
 2. ...
 3. ...
 4. ...
 5. ...
 6. ...
 7. ...
 8. ...
 9. ...
 10. ...

If you have any questions, please contact the office at (555) 123-4567.

Sincerely,
 [Signature]
 [Name]
 [Title]