Appendix Q6 – Reservoir level trends

Appendix Q7 – In/out of supply is included

7. Please provide an annotated timeline for the filling of side A and subsequent introduction to supply on 14th April 2016 (including when each activity/decision and sampling took place)

   Appendix Q7 – Hannington Annotated Timeline

8. Provide the relevant Duty Manager records for the introduction of the reservoir (side A) into supply in April 2016

   Appendix Q7 – Hannington Annotated Timeline (filter on 'DM Log' at column 'Data Source')

9. Provide the name of the local brook and a copy of any discharge consents. List any events that the EA have been involved with

   The receiving watercourse is unnamed.

   Due to the intermittent nature of any discharges the Environment Agency does not require a discharge consent. Anglian Water is required to apply to the Environment Agency for a Water Industry Act 1991 section 166 consent should a discharge be required to be undertaken.

   https://www.gov.uk/guidance/reservoir-discharges-consents-permits-and-risk-assessments

   As an example a recent Section 166 consent request is provided as Appendix Q9a with the corresponding consent issued by the Environment Agency provided as Appendix Q9b.

10. Provide the impact plan for side A going into supply in April 2016

    Response to follow (11 November 2022)

11. Provide the exact date and the impact plan for side B going back into supply in Feb 2017

    Response to follow (11 November 2022)

12. Please explain why the majority of sampling on the MIC form takes place in July 2017 (for tank B) not before Feb 2017

    Sampling results for June and July 2017 on MIC form 2361 relate to other assets on-site (e.g. cross-site pipework) none of which relate specifically to tank B.

The sample results for tank B (taken 01/02/2017) were not transferred to MIC form 2361 in error. However these results were provided to the Inspectorate in the 20-day report (DWI 2021 8379 - Figure 5).

13. Please explain why the materials are not listed for side A (only side B included) and also the reason that there are no samples or testing for side A

    MIC form 2361 lists both tank A and tank B using the key provided in columns AA and AB, respectively.

    The sample results for tank A (taken 16/04/2016) were not transferred to MIC form 2361 in error. However these results were provided to the Inspectorate in the 20-day report (DWI 2021 8379 - Figure 5).

14. Please explain why the standard section usually seen on Anglian Water MIC forms for signing off approval of materials for going into supply is not present on MIC form 2361

    This is an old style of MIC form which did not have the into supply sign-off section

15. Please provide any additional MIC records that exist for this site in addition to MIC form 2361 for the capital work

    Appendix Q15 MIC form 2674

16. Please provide the justification for the decision made that the organics detected on samples relevant to lines 108,115 and 122 was not significant – please explain the means of sampling and sample locations for these samples

    These are all on-site pipe work samples not connected to the tank. In line with our processes and procedures low level organics results are deemed acceptable if below their respective SNARLs levels.

    The sample referenced on line 108 is an existing supply sample. The location of where this was taken has not been specified.

    The sample referenced in line 115 would have been a sample tap on a temporary blank flange on the end of the new section of main.

    The sample referenced in line 122 would have been from a sampling location on an air valve on the new main.

    All three sample sets would have been taken as per standard AW sampling procedure.

17. What were the conclusions of the nettle odour on line 122 which also coincided with organics detections?

The existing supply sample taken as part of the set did not have a nettle odour, so issue appears to be within this new section of main. Both did have a positive organics detection but the compounds were different (both very low levels and below any SNARLs). Very low level organics/unusual odours in a new asset are not unusual and require flushing out.

18. Which MIC form line refers to the non-approved grout that was removed from tank A?

The product was not recorded on the MIC form; had it been requested for use under Part A it would have been rejected as non-approved.

19. What products does [redacted] refer to in line 104 of the MIC form?

The product was a Hawker electronics electrode for tank level measurement.

20. Please explain what BZ means in relation to 'clarity' on the MIC form (eg. Line 113)

'BZ' is one of clarity codes which means the water is 'clear and bright but with greater than 100 particles'.

21. Provide an update on the status of the two tanks (in/out of supply) and remedial work

Tank 1A is out of supply and 1B is in supply. Tank 1A is undergoing on-going remedial work; Tank 1B remains in supply until Tank 1A is returned to service.

22. Please supply the regulation 31 training records for the contractors, [redacted] and water quality staff (including but not exclusive to [redacted] in relation to this scheme, the training documents, assessments and sign-offs

Response to follow (11 November 2022)

23. Please provide the Anglian Water acceptance and sign off documents for the scheme – indicate if any snagging remedial work was required

Response to follow (11 November 2022)

24. The sample spreadsheet provided to the Inspectorate in Feb 2022 starts in 2017. Please resubmit the data from 2016 to present for both sides including enhanced organics sampling

Appendix Q24 – Hannington Reservoir data

25. Provide the names of the analysts where any tests have indicated that any panellist detected a taste or odour (from commissioning samples, testing or samples whilst the compartments were in supply)

Please see response to Q2

26. Please explain the location of the sample point in relation to tank A and tank B hydraulics

    Sample points are on roof of tank and drop directly into main body of water in the tank. These sample points have sample pumps.

27. Please explain why there is no organics samples for side A in the report submitted in Feb 2022. Please include this data in the updated version required above

    There are enhanced organics samples being taken from 1B because this is currently in supply. 1A is currently not in supply so the only trace organics data will be from MIC samples. We do not routinely monitor any storage points for trace organics which is why there will have been none of these results prior to 1A being removed from supply.

    See also Appendix Q24.

28. Where the organics result 'has something to report' please include the report on what was detected

    Any detection details will be in the "notes" on the MIC form.

29. Please provide the records from on-site tests for Taste and Odour since the reservoirs went back in supply - or a statement to confirm none taken since 2016

    As per our procedures we do not routinely undertake on-site taste and odour checks at storage point assets. On-site taste and odour checks are undertaken when returning storage assets to supply as per PSW-PRO-7.04 Cleaning and Refurbishment of Water Retaining Structures.

30. Provide the investigations and conclusions into >100 NLFs and 3 day plate counts from both sides of the reservoir since 2016. Why is the 3 day plate count trend not considered unusual?

    For both reservoirs elevated NLF counts commenced soon after the replacement of the regulatory final water sample point as part of our sample point refurbishment programme and were investigated in line with our standard procedures at the time.

    The NLF trends were not considered normal but due to the design of the tanks it was not possible to retain the existing sampling assets to provide direct comparison sampling when undertaking the refurbishments on these two tanks.

    Repeated resamples (including spot, flush and extended flush), multiple disinfections of the sample lines over an extended period, and sequential replacement of key parts of the sample lines, strongly suggested the issue

to be within the new sampling assets in both tanks, rather than within the two bodies of water.

Over this period 3-day plate counts were also slightly elevated and although the overall trend was not significantly elevated, were not considered to be normal. The 3-day results were investigated in tandem with the investigations in NLFs.

After repeated attempts to resolve the issues between April 2018 – March 2019 (Tank 1A) and June 2017 – August 2018 (Tank 1B) the combination of sample line disinfection and asset replacement provided results that were below all our bacteriological triggers and the investigations were closed down.

31. Provide the investigation into the coliform detection on 31/5/2017 – please explain why this does not appear in the water quality summary in the 20 day report

The coliform detection on 31/05/2017 was a sample tap refurbishment sample and not a regulatory (MT) sample and therefore was not included in the water quality summary in the 20-day report. The initial sample showed 1 TC failure and resamples were obtained in response. The resamples were clear for TC and the investigation was concluded at that point.

32. Please explain why three samples are taken on most sampling visits for the same parameters (according to the sample report provided Feb 2022) and the bacti sampling is not continuous to present day when other chemical samples are taken – please explain any gaps in the data

The response provided in the referenced sample report in February 2022 was in response to the request 'Please provide any operational sample results from the affected assets while they were in supply'. Our interpretation of this request was to provide any water quality monitoring data from these assets which was supplementary to the regulatory requirement for monitoring at the assets as we already provide the regulatory monitoring data to the Inspectorate within our monthly data returns we did not resubmit this information.

Appendix Q32 Hannington Reservoir 1A and 1B Sample Dates contains a calendar highlighting the dates on which routine monitoring sampling occurred which complies with the requirements of the Regulations.

33. Did the iron levels meet the Anglian Water internal trigger levels – what was the result of any investigation?

Iron was not part of the MIC suite when this work was undertaken.

Routine monitoring for iron is not carried out at all of our storage points. Internal monitoring samples were collected until 13 May 2016 until this ceased across the business.

Enhanced monitoring of iron at Hannington was restarted on 15 October 2020 as part of Wing WQAP 2600. At no point has the iron at Hannington 1A or 1B reached our internal target standard trigger level of 75 ug/l.

34. Provide an update on whether the pictures from internal inspections (pre and post going into supply) are now available. Please provide the pictures and inspection reports or a statement that they are not available and include the relevant IT service requests and the IT service desks response on whether they can be retrieved.

    Response to follow (11 November 2022)

35. Provide the results from any additional materials testing on the non-approved pipework that has been carried out

    Response to follow (11 November 2022)

Responses to questions raised in email of 16 September 2022 regarding Hannington WTW – 3rd tranche

Please note – The original text/questions from [redacted] email of 16 September 2022 are set out below in black with Anglian Water's responses provided in blue text.

Q23. Please provide the Anglian Water acceptance and sign off documents for the scheme – indicate if any snagging remedial work was required.

Unfortunately as of today, we have been unable to locate the documentation requested however our efforts continue and we will pass on the information should we find it.

Q35. Provide the results from any additional materials testing on the non-approved pipework that has been carried out.

The results are provided in Appendix Q35. Please note that these tests were undertaken in-house as evaluation trials and were not following any protocol set out in BS6920 or equivalent.

Additional questions ([redacted] email 4 November 2022)

In relation to the requests for information for the Hannington event 2021, the Inspectorate gave an extended deadline of 21 October on the request dated 16 September (25 working days after the request was made). I understand there will be some work involved for the company in collating the responses - but in this instance many of the questions were simple request for records that just needed forwarding to the Inspectorate.

These queries include:-

4_11_A There is no appendix Q6 – please provide the document

Provided 7 November 2022

4_11_B Question 4 – the internal inspection report should be a readily available record and could be provided by return;

Provided 7 November 2022

4_11_C Question 7 (and the missing appendix 6) should demonstrate dates in and out of supply up to the present day but the info in the report stops in 2017 – please update the report to present day

Appendix Q6 provided 7 November 2022; additional information requested will be provided by 18 November 2022.

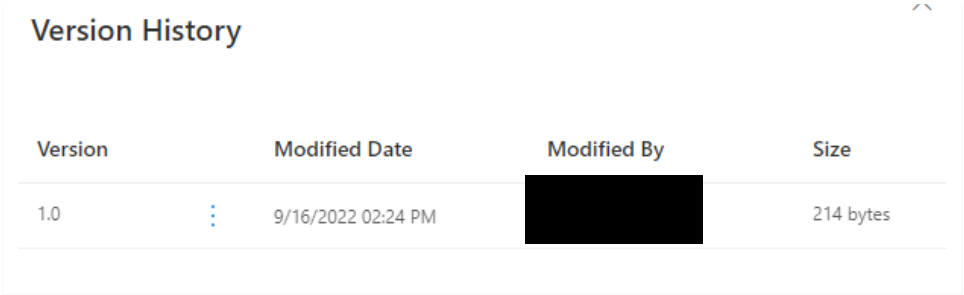
4_11_D Question 11 – The impact plan for this activity (putting the tank in supply) should be readily available;

Responses to questions raised in email of 16 September 2022 regarding Hannington WTW – 3rd tranche

Provided 7 November 2022

4_11_E Question 14 – Please provide the document control list for dates of changes to the MIC forms as there are many versions on the various submissions to the Inspectorate and there is no chronological order to the changes

As per our processes and procedures, controlled documents that are updated have a version history that is displayed on our share point site. Our MIC process is an ever developing one that has taken place over some years. Until recently the MIC form itself was not a controlled document. The MIC form has only become a controlled document this year as part of process improvements. As a result, there is no obtainable version history before this year. There has only been one controlled version of this document so far as evidenced by the version history list shown below.


Version History

Version	Modified Date	Modified By	Size
1.0	9/16/2022 02:24 PM	[redacted]	214 bytes

4_11_F Question 22 - The training records for in-house delivered training should be readily available and just require forwarding by email;

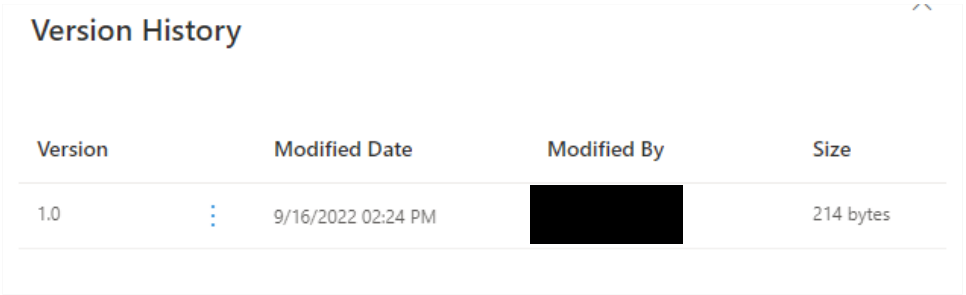
Provided 7 November 2022

Is it possible to have a response on the above questions by return?

Can you please include the following with the response due on 11 Nov:

4_11_G Question 14 – Please provide the document control list for dates of changes to the MIC forms as there are many versions on the various submissions to the Inspectorate

As per our processes and procedures, controlled documents that are updated have a version history that is displayed on our share point site. Our MIC process is an ever developing one that has taken place over some years. Until recently the MIC form itself was not a controlled document. The MIC form has only become a controlled document this year as part of process improvements. As a result, there is no obtainable version history before this year. There has only been one controlled version of this document so far as evidenced by the version history list shown below.


Version History

Version	Modified Date	Modified By	Size
1.0	9/16/2022 02:24 PM	[redacted]	214 bytes

4_11_H Question 24 – please include all dip sample results from 2016 to present

Response to follow (18 November 2022)

4_11_I Question 25 – the question was asked without the intention of making contact with the analysts

There have been no detections by any panellist for taste or odour at Hannington in the records presently held within the laboratory.

For records not within the laboratory but archived off-site, in order to determine the names of the analysts the original worksheets will need to be retrieved and manually reviewed as the initials of the analysts (and hence names) are not stored electronically. This will involve individually examining hundreds if not thousands of separate worksheets. We store a few months at the laboratory but the rest will need to be requested from our store which takes several days for delivery. With the exception of November and December 2016 all paper records from 2016 and earlier have been destroyed as we only keep data for the required 6 years. In addition, retrieving the records will be quite difficult logistically as it is estimated that the records will fill more than 60 large packing cases which will need to be delivered to the lab, taking several deliveries, as well as finding a secure location within the lab to store the records as they are being manually examined. The process of reviewing the documents will be labour-intensive and hence the timescales for being able to provide a final report will be in the order of a minimum of 6 – 8 weeks.

In view of this we would respectfully request the Inspectorate to reflect on the value of the information this exercise would produce and the relevance of this information to progressing the investigation and advise if it is still considered a requirement.

4_11_J Question 28 – Please provide the results for both compartments where the profile indicates there 'is something to report' in the sampling results (the question is not restricted to the MIC form results)

There have been no trace organics detections on compartment A since 2016. There have been a small number of trace organics detections on compartment B since 2016 in line with our commitment to carry out enhanced trace organics monitoring on this compartment whilst it remains in supply. This monitoring began in January 2022, please see results below.

Date	Time	Point Code	Point Name	Water Profile result µg/l	ug/l
20/01/2022	09:20	W01CAJLCR	HANNINGTON NO 1 RES SIDE B	Nonanal	0.14
20/01/2022	09:20	W01CAJLCR	HANNINGTON NO 1 RES SIDE B	Tridecanol* best fit	0.19
03/02/2022	12:38	W01CAJLCR	HANNINGTON NO 1 RES SIDE B	Nonanal	0.1
09/02/2022	14:23	W01CAJLCR	HANNINGTON NO 1 RES SIDE B	Nonanal	0.12
04/03/2022	07:46	W01CAJLCR	HANNINGTON NO 1 RES SIDE B	Nonanal	0.13
20/04/2022	08:10	W01CAJLCR	HANNINGTON NO 1 RES SIDE B	Total heavy gas oil	0.69
24/05/2022	07:33	W01CAJLCR	HANNINGTON NO 1 RES SIDE B	Nonanal	0.13
22/07/2022	07:59	W01CAJLCR	HANNINGTON NO 1 RES SIDE B	Nonanal	0.14
02/09/2022	13:39	W01CAJLCR	HANNINGTON NO 1 RES SIDE B	Ethyl hexanol	0.12
02/09/2022	13:39	W01CAJLCR	HANNINGTON NO 1 RES SIDE B	Nonanal	0.12
02/09/2022	13:39	W01CAJLCR	HANNINGTON NO 1 RES SIDE B	Tridecanol * best fit	0.1
29/09/2022	07:24	W01CAJLCR	HANNINGTON NO 1 RES SIDE B	Nonanal	0.11

4_11_K Question 30 – please provide the sample results to support the conclusion about the samples tap being the cause for the trends

Please see attached Appendix 4_11_K Question 30 showing examples of results for Reservoirs 1A and 1B. These indicate where there have been high levels of NLFs on an initial sample and that the resamples have also shown elevated levels of NLFs from the tap but not in the corresponding dip sample taken from the main body of water at the same time.

4_11_L Question 31 – please provide the resample results (include dates, times, locations)

The resamples were taken from Hannington 1B Sample tap on 02/06/2017 at 19:19 as shown in the results below:

Sample date & time:	02/06/2017 19:19:00
Comments:	53744601 AW HANNINGTON 1B SAMPLE TAP
Resample number:	17244298

Determinand	Name	Result	Unit
09111	Chlorine Free	0.12	mg/l CL2
09121	Chlorine Total	0.58	mg/l CL2
09320	3-day Colony Count at 22C	0	No/ml _
09340	2-day Colony Count at 37C	0	No/ml _
25491	E.Coli Presumptive at 44C	0	No/100ml _
91931	Coliforms Presumptive at 37C	0	No/100ml _
91941	Coliforms Confirmed	0	No/100ml _
91951	E.Coli Confirmed	0	No/100ml _

4_11_M Question 32- please provide the full report including all samples taken and the reason for the sample (regulatory/operational). Please explain why the operational bacti sampling was stopped/reduced

Response to follow (18 November 2022)

8 November queries (email) on 16 September 2022 questions – Hannington

8_11_A Q4 refers to before the asset went into supply following the capital scheme and the new pipework – please provide this record

Response to follow (18 November 2022)

8_11_B See previous requests in the response regards to the training records for personal involved with the capital scheme at Hannington (format of the training information and dates).

Response to follow (18 November 2022)

From: WQRegulation
To: [redacted]
Cc: [redacted] WQRegulation
Subject: RE: Tank Inspection Request
Date: 24 November 2022 16:17:14
Attachments: image001.jpg
4850 Hannington 1 WR Remedial Work.xlsm
20221028_132538.jpg
20221028_132609.jpg
HANNINGTON WR1A (St1,Tnk1) Internal Report (Final 28-10-2022) encrypted.xlsm

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Good afternoon [redacted]

As previously requested please find attached the MIC form, inspection report form and pictures for Hannington reservoir. We are expecting the return to service early next week.

Best regards

[redacted]

Dr [redacted]
Water Quality Regulation Manager

Mobile: [redacted]

Anglian Water Services Limited
Lancaster House, Lancaster Way
Ermine Business Park, Huntingdon
Cambridgeshire, PE29 6XU

From: [redacted] <[redacted]defra.gov.uk>
Sent: 14 September 2022 15:02
To: [redacted] <[redacted]anglianwater.co.uk>; WQRegulation <WQRegulation@anglianwater.co.uk>
Subject: Tank Inspection Request

***EXTERNAL MAIL* - Please be aware this mail is from an external sender - THINK BEFORE YOU CLICK**

Dear [redacted] Please find attached a letter in relation to inspecting the tanks associated with the 2021 Regulation 31 events.
Thanks
[redacted]

[redacted] | Inspector | Drinking Water Inspectorate
Mobile: +44 (0)[redacted] | Email: [redacted]defra.gov.uk | www.dwi.gov.uk
1A Nobel House, 17 Smith Square, London, SW1P 3JR

Hannington Reservoir 1A Internal Inspection Dec 2021 & Apr 2022

General Condition

Hannington Reservoir 1A Internal Inspection Dec 2021 & Apr 2022

New inlet pipe

Hannington Reservoir 1A Internal Inspection Dec 2021 & Apr 2022

New outlet pipes

Hannington Reservoir 1A Internal Inspection Dec 2021 & Apr 2022

Old inlet stack pipe

Original outlet pipe

Hannington Reservoir 1A Internal Inspection Dec 2021 & Apr 2022

Sediment on floor

Washout and overflow pipework

From: [redacted]
To: [redacted]
Subject: FW: ANH Regulation 28 Risk Lines
Date: 03 July 2024 16:17:23
Attachments: image001.jpg
ANH Reg 28 Questions 230119 Supporting Information.xlsx

From: [redacted]@anglianwater.co.uk>
Sent: Thursday, February 2, 2023 5:35 PM
To: [redacted]@defra.gov.uk>; [redacted]<[redacted]anglianwater.co.uk>; WQRegulation <WQRegulation@anglianwater.co.uk>
Cc: SM-Defra-DWI_RA_Audit_Team (DEFRA) <DWI.RA.AuditTeam@defra.gov.uk>; [redacted]<[redacted]defra.gov.uk>; [redacted]<[redacted]defra.gov.uk>
Subject: RE: ANH Regulation 28 Risk Lines

> You don't often get email from [redacted]@anglianwater.co.uk. Learn why this is important

Hi [redacted]

Please see below for our responses (in blue) to your request for further information:

1. Could the team please send me the Water Quality Action Plan TSS-2021-378 referenced in Kedington risk lines.
   Please find the requested Water Quality Action Plan TSS-2021-378 as part of the attached spreadsheet. The WQAP covers actions at Great Wratting WTW, which is the in service site, whilst Kedington WTW is out of service. The Reg 28 asset TKED covers both source works and the sample point is a blend point. At the time of the odour detection, it was Great Wratting WTW water only as Kedington WTW was out of supply.

2. on all the other risks that do not reference a WQAP, could the team please elaborate a bit further on what mitigation/verification is currently being done while remedial work is not completed, if asset is in supply?
   Diddington Reservoir (RDIDD), Hannington Reservoir 1A (RCGJL) and Pitsford WTW (TPTW1) storage tank B remain out of supply.
   Hannington 1B is the only asset that required pipework remedial work that was kept in supply and has had enhanced weekly trace organics sampling monitored by a dedicated WQ Risk Scientist.

3. Can you please also provide an update if any of these tanks are in or out of supply?
   Diddington Reservoir (RDIDD) - out of supply
   Kedington WTW (TKED) Contact/Balance Tank - out of supply, Kedington WTW tanks remain out of supply, however the blend site Great Wratting WTW is in supply
   Pitsford WTW (TPTW1) Storage Tank B - out of supply
   Hannington Reservoir 1A (RCGJL) - returned to supply 29th November 2022 following pipework remedial work. Currently in 3 month monitoring phase.
   Hannington Reservoir 1B (RCAJL) - in supply with enhanced trace organics sampling, due to be removed from supply for pipework remedials to be completed.

4. Could you please send any sample results regarding T&O and organic compounds/GCMS scans for assets in supply from September to present.
   Hannington Reservoir 1B (RCAJL) is the only asset requiring outstanding pipework remedial work that has remained in supply. Enhanced weekly sampling is being carried out for trace organic compounds, see separate tab for sample results.
   Pitsford WTW (TPTW1) is in supply, however the affected tank (Storage Tank B) is out of supply, therefore no enhanced sampling has been set up for this asset.

5. Could you please also provide an update on the risk ID ANH-TPTW1-A004-TR1112 and the reason behind being a category A?
   The risk ID ANH-TPTW1-A004-TR1112 was a category A in error. This has been updated to a category D with the additional control measures of 'pipework remedial work planned' and comments of 'reservoir pipework event'. Please find the updated Reg 28 line for Pitsford WTW (TPTW1) in the attached spreadsheet.

Kind regards,
[redacted]

[redacted]
Water Quality Regulation Scientist
Mobile: [redacted]

Anglian Water Services Limited
Lancaster House, Lancaster Way
Ermine Business Park, Huntingdon
Cambridgeshire, PE29 6XU

From: [redacted]@defra.gov.uk>
Sent: 19 January 2023 10:52
To: [redacted]<[redacted]anglianwater.co.uk>; WQRegulation <WQRegulation@anglianwater.co.uk>
Cc: SM-Defra-DWI_RA_Audit_Team (DEFRA) <DWI.RA.AuditTeam@defra.gov.uk>; [redacted]<[redacted]defra.gov.uk>; [redacted]<[redacted]defra.gov.uk>
Subject: ANH Regulation 28 Risk Lines

EXTERNAL MAIL **- Please be aware this mail is from an external sender - THINK BEFORE YOU CLICK**

Hi [redacted] how are you?
I was looking into the following risks below, relating to the Regulation 31 pipework event, and I need some further information.

- Could the team please send me the Water Quality Action Plan TSS-2021-378 referenced in Kedington risk lines.
- Also on all the other risks that do not reference a WQAP, could the team please elaborate a bit further on what mitigation/verification is currently being done while remedial work is not completed, if asset is in supply?
- Can you please also provide an update if any of these tanks are in or out of supply?
- Could you please send any sample results regarding T&O and organic compounds/GCMS scans for assets in supply from September to present.
- Could you please also provide an update on the risk ID ANH-TPTW1-A004-TR1112 and the reason behind being a category A?

I appreciate if you could respond within 10 working days.

Thank you.

Assessment Date	Site Ref	Site Name	Stage	Hazard Code	Hazard Name	Hazardous Event	RAR Category	Additional Control Measure Details	Comments	Unique Record ID Ref
01/09/2022	RDIDD	Diddington Reservoir	Storage	A004	Taste (Taste Quant)	Use of unapproved chemicals/materials	C	Remedial work for reservoir pipework		ANH-RDIDD-A004-ST0417
01/09/2022	RDIDD	Diddington Reservoir	Storage	H064	Hydrocarbons	Use of unapproved chemicals/materials	C	Remedial work for reservoir pipework		ANH-RDIDD-H064-ST0485
01/09/2022	RDIDD	Diddington Reservoir	Storage	H006	Solvents	Use of unapproved chemicals/materials	C	Remedial work for reservoir pipework		ANH-RDIDD-H006-ST0487
01/09/2022	RDIDD	Diddington Reservoir	Storage	A003	Odour	Use of unapproved chemicals/materials	C	Remedial work for reservoir pipework		ANH-RDIDD-A003-ST0337
01/09/2022	RCGJL	Hannington Reservoir 1 (A)	Storage	H006	Solvents	Use of unapproved chemicals/materials	C	Remedial work for reservoir pipework		ANH-RCGJL-H006-ST0487
01/09/2022	RCGJL	Hannington Reservoir 1 (A)	Storage	H064	Hydrocarbons	Use of unapproved chemicals/materials	C	Remedial work for reservoir pipework		ANH-RCGJL-H064-ST0485
01/09/2022	RCGJL	Hannington Reservoir 1 (A)	Storage	A003	Odour	Use of unapproved chemicals/materials	C	Remedial work for reservoir pipework		ANH-RCGJL-A003-ST0337
01/09/2022	RCGJL	Hannington Reservoir 1 (A)	Storage	A004	Taste (Taste Quant)	Use of unapproved chemicals/materials	C	Remedial work for reservoir pipework		ANH-RCGJL-A004-ST0417
01/09/2022	RCAJL	Hannington Reservoir 1 (B)	Storage	A004	Taste (Taste Quant)	Use of unapproved chemicals/materials	D	Removal of asset required for pipework inspection and remedial work	Reservoir pipework event	ANH-RCAJL-A004-ST0417
01/09/2022	RCAJL	Hannington Reservoir 1 (B)	Storage	A003	Odour	Use of unapproved chemicals/materials	D	Removal of asset required for pipework inspection and remedial work	Reservoir pipework event	ANH-RCAJL-A003-ST0337
01/09/2022	RCAJL	Hannington Reservoir 1 (B)	Storage	H064	Hydrocarbons	Use of unapproved chemicals/materials	D	Removal of asset required for pipework inspection and remedial work	Reservoir pipework event	ANH-RCAJL-H064-ST0485
01/09/2022	RCAJL	Hannington Reservoir 1 (B)	Storage	H006	Solvents	Use of unapproved chemicals/materials	D	Removal of asset required for pipework inspection and remedial work	Reservoir pipework event	ANH-RCAJL-H006-ST0487
01/09/2022	TKED	Kedington WTW	Treatment	A004	Taste (Taste Quant)	Use of unapproved chemicals/materials	C	Water Quality Action Plan TSS-2021-378		ANH-TKED-A004-TR1112
01/09/2022	TKED	Kedington WTW	Treatment	A003	Odour	Use of unapproved chemicals/materials	C	Water Quality Action Plan TSS-2021-378		ANH-TKED-A003-TR0942
01/09/2022	TPTW1	Pitsford WTW (Pitsford Reservoir)	Treatment	H064	Hydrocarbons	Use of unapproved chemicals/materials	D	Pipework remedial work planned	Reservoir pipework event	ANH-TPTW1-H064-TR1282
01/09/2022	TPTW1	Pitsford WTW (Pitsford Reservoir)	Treatment	A004	Taste (Taste Quant)	Use of unapproved chemicals/materials	A			ANH-TPTW1-A004-TR1112
01/09/2022	TPTW1	Pitsford WTW (Pitsford Reservoir)	Treatment	A003	Odour	Use of unapproved chemicals/materials	D	Pipework remedial work planned	Reservoir pipework event	ANH-TPTW1-A003-TR0942

01/09/2022	TPTW1	Pitsford WTW (Pitsford Reservoir)	Treatment	H006	Solvents	Use of unapproved chemicals/materials	D	Pipework remedial work planned	Reservoir pipework event	ANH-TPTW1-H006-TR3488

Kind Regards,

[redacted]

Inspector | Drinking Water Inspectorate
Mobile: [redacted] | Email: [redacted]@defra.gov.uk | www.dwi.gov.uk
Risk Assessment Team: DWI.RA.AuditTeam@defra.gov.uk
Area 1A, Nobel House, 17 Smith Square, London, SW1P 3JR

Kedington Water Quality Incident Report 09/07/2021

Contributors:

[redacted], Director of @one Alliance
[redacted]Chief Engineer, Anglian Water
[redacted], Head of Safety, Health, Environment and Quality @one Alliance

Introduction
The Investigation Team broke up the elements of the investigation into three areas, to review what happened, how it happened and to make recommendations to ensure similar issues do not repeat in the future. These areas were:

- Procurement & Contractual relationship with the supplier FLI
- Design / Engineering Standards & Decision Making
- Delivery Assurance & Compliance

Learning Points
The review of the incident, has identified several learning points, that are both direct and indirect factors in allowing the event to be realised, these are as follows:

- Suitability / Capability of the Supplier (FLI). FLI are one of four MEICA framework suppliers appointed for AMP6; the companies were selected based on a range of requirements including technical competence and experience as per procedure ALL-GUI_TD-001. The register ALL-GUI-TD-011 should be reviewed annually to assure continued adherence, at the time the works were completed this assessment was valid. However, subsequently key personnel from FLI left their organisation.
- Change Management, the design development was not recorded sufficiently to identify when and why the design was changed from Epoxy coated carbon steel pipework to Ductile Iron.
- Control of MIC to ensure compliance is dependent on the individual's knowledge and visibility of procured equipment to complete adequately.
- The timing of MIC review this needs to be frequently assessed as the detail is often not defined until mid-way through construction.
- Standard Material Notation Sheet for Pipework does not reference MIC requirements and highlights the need to not only revise the notation but ensure that a design standard explicitly identifies compliance.
- Delivery Assurance reference to MIC requirements and processes were complex to follow.
- Over reliance on Individual Competence rather than combined Assurance Processes. The assurance processes utilised during the delivery stages do not make direct reference to MIC and Regulation 31 requirements.

Recommendations

The report highlights a number of recommendations to prevent a future re-occurrence of a similar incident. The table below outlines those recommendations, as well as the most suitable Partner to lead and support the actions required.

Item	Recommendation	Shared Lesson	Action	
			Lead	Support
1	Combined Assurance Process Improvement – remove a number of the siloes that exist that prevent the easy passage of critical information between teams, also review standard inspection and assurance templates to include clear and unambiguous reference to MIC and clearer links backs to standards and the design.	Yes	@one	AWS
2	Training – POSWSH training, including MIC compliance will be assigned in central database to all related disciplines including and annual re-assessment on e-learning training.	Yes	AWS /@one	Pan Alliance
3	Full review of all water MAS to ensure that a consistent messaging about materials in contact currently this information is fragmented and difficult to follow.	Yes	AWS / @one	Pan Alliance
4	A full review of all Mechanical / Pipeline Design Guides to be undertaken to ensure a full suite of standards directly connected to ensuring MIC compliance and awareness, including the creating of a dedicated pipework design guide which includes a full review of 'Standard' material notations.	Yes	@one	AWS
5	Align Scientific, Procurement and Design to enable a real-time database of materials in contact for use within the delivery team.	Yes	AWS	@one
6	Embedment of MIC requirements to BIM data.	Yes	@one	AWS
7	Undertake annual re-evaluation of individual and company competency to undertake MIC design, procurement and installation on water projects.	Yes	AWS /@one	Pan Alliance

A detailed improvement plan will need to be developed from these recommendations, once accepted, detailing resources and timelines to achieve them.

Additional Learning Points from Diddington, Hannington and Pitsford Incidents 20/12/2021

Contributor: [redacted] Chief Engineer, Anglian Water

Learning Point:

Whilst the designer has specified Ductile Iron (DI) and its need to comply with Regulation 31 its specific Regulation 31 requirements would also need to be included for example if the pipe was for conveyance or conveyance and submersion.

Recommendation(s)

- **Designers to be aware that specification needs to be exacting, rather than implied. Highlight the difference in pipework for conveyance and submersion as Procurement and Supplier cannot be relied upon to interpret information.**
- **Detail drawings should not have 'generic' references to materials in contact, rather specific identification in both drawing and procurement schedules highlighting specific need.**
- **Designers / CAD technicians, assessment and training as to knowledge of construction & fabrication techniques to ensure correct specification and usage.**

Learning Point:

Between design and construction the design was changed to remove the use of Ductile Iron for the duck foot bends, riser and bell-mouth, by a pre-fabricated carbon steel pipe with an approved fusion bonded epoxy coating (applied by Northpoint coatings). Given the significant stability and weight concerns of the duck foots and risers to the bell-mouths it is likely to be construction driven decision to transition from DI to Carbon Steel.

Whilst the move towards an epoxy coated carbon steel was in this case a betterment, it was also an opportunity to include the connecting pipework (up to the wall transition) in the same material for specification avoiding the use of DI in a submersed condition without the correct coating.

Recommendation(s)

- **Design changes (Change Control) must always be closed off with the designer. In turn this change will have a defined and auditable trail allowing correct specification / purchase to be undertaken. This will also allow for design enhancements to be identified.**

Learning Point:

The design of the wall transitions, via box outs, specifies Ductile Iron. In particular, the overflow uses a socket design, to create an external movement joint, which will pre-determine that a pipe for conveyance standard (socket / spigot) would be modified to achieve a cut length, fitting of a puddle flange and termination flange leading to overcoating of the factory applied coating due to damage during fitting of these items. This overcoated material, epoxy base, is then exposed to a submersed condition within the reservoir.

Recommendation(s)

- **Ensure best practice and learning from previous pre-cast reservoirs in relation to the use of cast in-situ wall couplings is always followed.**

- **Any modification to factory applied coatings shall be clarified (to include compliance with Instructions For Use (IFU)) and agreed before undertaking and correctly recorded and approved on the MIC register.**

Learning Point:

Touch up paint is used where epoxy coating regularly receives damage during handling / assembly and is address by a proprietary repair system ordered or supplied from the pipe supplier.

Recommendation(s)

- **Designers should be aware of the need to advise the conditions contained within the Instruction For Use (IFU) of such repair kits with respect to preparation requirements and cure times / temperatures.**
- **Standard Drawings / Specifications should allow a set quantity, per order of pipe, of a certified touch up paint. To note: this differs to most of the pre-cast units used in this region using cast in-situ wall couplings**.
- **All areas of repair should be accounted for and record of IFU application be recorded and entered to the MIC register.**

guardians of drinking water quality

THE WATER SUPPLY (WATER QUALITY) REGULATIONS 2016 (AS AMENDED)

NOTICE UNDER REGULATION 28(4)

ANGLIAN WATER SERVICES LIMITED: Hall Water Treatment Works

Version Number: 1

Hall Water Treatment Works
Grimsby Skegness Supply System

DWI Reference: ANH-2019-00001

THE SECRETARY OF STATE:

1. has received a report from Anglian Water Services Limited (the "**Company**") dated 1 October 2018 (the "**Report**") which states that there is or has been a significant risk of supplying water from Hall WTW that could constitute a potential danger to human health and could be unwholesome.

2. **GIVES NOTICE** to the Company under regulation 28(4) of the Water Supply (Water Quality) Regulations 2016 (as amended) that it must satisfy the following requirements:

For risks associated with:
Disinfection and chlorine demand,
Disinfection by products,
Substances and products in contact with drinking water,
Inadequate treatment

Requirements	**Date until/by which requirements must be maintained/ satisfied (as appropriate)**
(a) to maintain the following measures for the period specified [in each case]:	
i. Optimise the treatment processes at Hall WTW to ensure continued compliance with regulatory standards and minimise the formation of disinfection by-products.	Ongoing for the duration of the Notice
ii. Carry out enhanced monitoring of disinfection by-products including trihalomethanes (THMs), haloacetic acids (HAAs), and	

	chlorate through the treatment processes, where available, and at the works final, the point of blending with Newton WTW, and associated public water supply zones, and for bromide through the treatment processes and bromate in the final water, at a frequency of once per week. Continue to undertake online monitoring for THMs on the final water.	
iii.	Investigate any results that are above 50% of the PCV for THMs. Report all regulatory exceedances of THMs to DWI as an event, and take steps to protect public health as appropriate.	
iv.	Calculate chlorine demand at the final water at Hall WTW and respond to results as appropriately, to ensure there is no risk to public health.	
v.	Continue with online monitoring for hydrogen peroxide immediately following the polishing granular activated carbon process stage.	
vi.	Continue to gain further understanding of the organic loading and disinfection by-product formation potential at Hall WTW.	

(b) to review, revise and/or make operational the following measures, by the date specified below:

i.	Calculate the contact time and surface to volume ratio for the active PAX mixers, taking a worst case scenario when site is out of supply but water remains in the tank, to determine compliance with regulation 31 (4)(b) under all circumstances, considering the unit as a whole and the number of units per cell.	31 July 2019
ii.	Review governance of Regulation 31 within the company.	31 August 2019
iii.	Carry out a full review of catchment risk assessment. This must include all hazards and hazardous events, and be informed by catchment studies, pollution incident records, land use, industrial processes and discharges, infrastructure, and any other potential source of contamination within the catchment which could affect the abstraction. Carry out an assessment of the risks at the abstraction, using catchment data, rainfall, and all other sources as appropriate. Investigate and assess the efficacy of existing catchment mitigations.	31 October 2019

iv.	Carry out a process review to identify the performance capabilities of the existing processes to treat all aspects of the raw water quality under all conditions.	31 October 2019
v.	Carry out a gap analysis against existing catchment mitigations and treatment processes.	31 October 2019
vi.	Install appropriate sampling facilities throughout Hall treatment stages to allow for inter stage analysis.	Throughout the duration of the Notice
vii.	Undertake regular inter stage sampling for key water quality hazards identified in the risk assessment, including organic carbon, and targeted full suite of analysis with scans, at an appropriate frequency to inform decision making. Sampling to be carried out under all operating conditions and raw water quality.	31 December 2019
viii.	Review the removal efficacy of the current process stages and further optimise the treatment processes based on the results. Develop appropriate inter-stage process controls to allow ongoing control and management of the treatment processes.	31 December 2019
ix.	Review relevant research on DBP's from advanced oxidation processes, and implications for process operation. Summarise technical reports, optimisation and research work undertaken at Hall WTW into a single peer-reviewed report. Review the recommendations from the report and use the learning to inform further work.	31 March 2020
x.	Investigate technical solutions to address the gap analysis, to minimise the formation of disinfection by-products, and to mitigate against all the risks identified in the risk review.	31 December 2020
xi.	Carry out pilot tests of any proposed technical solution(s), and assess the performance in terms of wholesomeness, all relevant water quality parameters and minimisation of disinfection by-products.	31 December 2021
xii.	Design and implement any chosen technical solutions to address the identified risks.	31 December 2021
xiii.	Review the efficacy and the risks associated with the active aeration system	

(c) to audit whether the measures have been effective by the following means:

i.	Weekly monitoring for disinfection by products as described in (a)ii, on the final water at Hall WTW, at the point of blending with Newton WTW, and in associated public water supply zones, (THMs, HAAs, bromate and chlorate).	Report quarterly for the duration of the Notice
ii.	Raw and final monitoring for hazards identified in catchment review (b)ii.	
iii.	Inter-stage monitoring for process control parameters, as described in (b)vii.	

(d) not to supply water for regulation 4(1) purposes from Hall WTW unless the conditions specified below are satisfied:

i. Not Applicable

(e) to provide the following information in the time and manner specified below to enable monitoring of progress towards the mitigation of the risk of supplying water that would constitute a potential danger to human health:

i.	Provide a progress report annually by 31 January and against the following milestones to include: a) Enhanced monitoring for disinfection by-products including trend analysis. b) Monitoring of hydrogen peroxide post GAC. c) Investigational monitoring data, including hazard analysis, inter-stage monitoring, raw and final data and trend analysis. d) Compliance with all regulatory requirements	
ii.	Compliance with Regulation 31, with regard to contact time of the PAX system, hydrogen peroxide, and the review of governance of Regulation 31 within the company.	30 September 2019
iii.	Catchment risk assessment, treatment process review and gap analysis report.	30 November 2019
iv.	Summary of research and findings from treatment trials into understanding of organic loading and DBP's. Report on optimisation and strategy for treatment and minimisation of disinfection by-products at Hall WTW	31 January 2020
v.	Design of technical solution(s	TBC

vi.	Completion of technical solution(s)	TBC
vii.	Review the risk assessment for Hall WTW as required by Regulation 27(3) and subsequently submit a revised Regulation 28 report accompanied by a signed board level declaration.	Ongoing for the duration of the Notice
viii.	Submit a satisfactory completion report.	13 months after the completion of the work

Failure by the Company to comply with this Notice may result in enforcement proceedings under section 18 of the Water Industry Act 1991.

Signed by authority of the Secretary of State

Deputy Chief Inspector

11 June 2019

DWI Reference: ANH-2019-00001

Water Company:	Anglian Water
DWI Scheme Reference:	ANH-2019-00001
Scheme name:	Hall Water Treatment Works, Grimsby Skegness Supply System
Quality Parameter/s, hazard/s or risk/s:	Disinfection and chlorine demand, Disinfection by products, Substances and products in contact with drinking water, Inadequate treatment
Report for Steps:	(b) ii, Review governance of Regulation 31 within the company. (e) ii, Compliance with Regulation 31, with regard to contact time of the PAX system, hydrogen peroxide, and the review of governance of Regulation 31 within the company.

The purpose of this paper is to provide assurance and detail the current governance process within Anglian Water to ensure compliance with Regulation 31, and to also provide additional detail of the review of the governance of the Regulation 31 processes and areas which have been identified for further development.

A separate update has been provided with regard to the contact time of the PAX system, and hydrogen peroxide for clarity in response to the Step requirements of (b) i, and (e) ii.

Compliance with Regulation 31 – governance within POSWSH

Compliance with Regulation 31 is managed through section 3 of our internal document POSWSH, (Policy and Standards for Water Supply Hygiene) which covers our policy, standards and procedures covering 'Materials and chemicals in contact with water'.

Section 2 of POSWSH, details our policy and standards for "Asset Design and Creation" and mandates that all assets involved in the production and delivery of drinking water will be designed, commissioned and decommissioned to ensure that they do not impact adversely on water quality, including meeting all Regulation 31 requirements.
Our Minimum Asset Standards define our asset design criteria and design envelope requirements which are developed according to the POSWSH policy and standard requirements, which must be adhered to by our Alliance partners for any scheme delivery.

POSWSH is structured into 12 separate sections with an overarching policy statement and supporting standards for each section. Detailed procedures are included in each section to clearly define how the policy and standards are delivered within the business.

The structure of POSWSH follows a drinking water safety planning approach aligned from source to tap, with the document detailing regulatory requirements where applicable, good practise, industry learning and general requirements for operation and maintenance of our assets source to tap to ensure the delivery of safe, clean drinking water.
Each of the 12 sections of POSWSH are assigned to a member of the Water Quality Management team and those section owners are responsible for ensuring that the policy and standards are relevant and current. All policy and standards are reviewed annually and any changes or proposed amendments must be approved at the POSWSH Approval Group (PAG) which is held bi – monthly.
Following the recent Business Operating Model changes within Anglian Water the Terms of Reference for PAG have just been revised, this includes the change of the Head of Supply assigned as chair, (this was previously the Director of Water Services), and the Head of Water Quality as vice chair of the meeting. The meeting must have a quorum attendance to approve changes to any policy and standards.

<u>Compliance with regulation 31 within section 3 of POSWSH - Materials and chemicals in contact with water</u>

The Water Quality Risk Manager is the section owner of the standards and procedures within section 3 'Materials and chemicals in contact with water'. The policy and standards were reviewed in July 2019 and approval gained at PAG 30 July for minor updates to the document. The section owner is required to attend PAG to present any proposed changes to policy and standards.

The overarching policy statement for materials and chemicals in contact with is provided below;
"*All chemicals and materials used in contact with water will be sourced and used in accordance with regulatory requirements and company procedures. All chemicals and materials used in contact with water will go through an internal verifications process prior to purchasing and use. All materials and chemicals used in contact with water from its point of abstraction to the customer's boundary fall under the requirements of Regulation 31 and the scope of this policy*."

This policy statement is supported by two standard policy and standard, sub sections:

- Materials and chemical approval
- Delivery and storage of chemicals and fuels.

The policy statements 3.01 - our policy on materials and chemicals approval and 3.02 – our policy on delivery and storage of chemicals and fuels are delivered through compliance with the supporting standards which are detailed within each of these two sub sections. A copy of POSWSH Section 3.0 - policies and standards; Materials and chemicals in contact with water is provided with this submission.

Underpinning the policy and standards are two procedures which detail how we deliver the requirements of the standards and the high level policy, these procedures are provided below:

- PSW-PRO-3.01 Materials and chemicals in contact with water
- PSW-PRO-3.02 Delivery and management of bulk and containerised chemicals (including fuel) within water services.

Each procedure has assigned authors both of which are members of the Water Quality team and are within the Water Quality Risk and Optimisation Managers team.

POSWSH procedures are required to be reviewed every two years, with the assigned author responsible for the review with the support of subject matter experts. Compliance with the review process is tracked through a monthly POSWSH review meeting which is chaired by the Water Quality Policy and Strategy Manager. The meeting is attended by all of the Water Quality Management team.

PSW-PRO-3.01 Materials and chemicals in contact with water was last reviewed and reissued December 2018, and a minor update was made 23 September 2019 to include reference to the DWI advice sheets 9 and 10 within section six of this document. The document previously included reference to the DWI advice sheets 3,5,7 and 8. This procedure has been reissued with the details of those changes made within the associated briefing note.
PSW- PRO-3.02 Delivery and management of bulk and containerised chemicals (including fuel) within water services was last reviewed and reissued March 2019.

Any changes which are identified which prompts a review prior to the defined review periods are undertaken as due process. For example the recent March 2019 review of the procedure 'Delivery and management of bulk and containerised chemicals (including fuel) within water services' was undertaken as a direct result of our internal audit process and our 'could it happen here' industry learning process, the latter of which reported upon the incorrect delivery of a chemical to the wrong chemical storage tank within another water company. We specifically asked if the same event could happen within Anglian Water and we identified areas for development within this procedure, further detail on this is provided later in this paper. Additionally, this industry learning was provided as an update to our Water Services Compliance Monitoring Group, along with agreed actions.

Further detail on our 'could it happen here' process is provided later in this paper.

<u>PSW-PRO-3.01 Materials and chemicals in contact with water</u>

The purpose of PSW-PRO-3.01 Materials and chemicals in contact with water is to define the processes by which materials and chemicals are verified as compliant with Regulation 31 of the current Water Supply (Water Quality) Regulations, and details the sampling requirements to verify that materials and chemicals introduced have not caused

deterioration in water quality. The scope of the procedure covers all materials and chemicals used in contact with untreated or treated water from the point of abstraction up to the customer's boundary.

An overview of the procedure is provided below.

Responsibilities are clearly defined for key roles involved within the Materials in Contact and Regulation 31 governance processes. With responsibility within the installation process, the approval to use process, the supply chain management and framework agreement process and the water quality team clearly identified. Those key roles are provided below:

- Manager or Engineer responsible for the installation of a new material in contact with the network
- Water Quality Risk Scientist/Standby Scientist
- Supply Chain Professional
- Water Quality Risk and Optimisation Manager.

This procedure includes the requirement for the completion of a Materials In Contact (MIC) form and the detailed governance process for approvals.

The Manager or Engineer responsible for the installation of a new material in contact with treated water or untreated water has responsibility to ensure any materials used in contact with water from abstraction up to the customer's boundary box comply with Regulation 31. They also must ensure that the Water Quality Risk team is notified of the intent to use a material and that the required information on the MIC form complies with Regulation 31.

The Water Quality Risk Scientist and Standby Scientist have responsibility to ensure that Material In Contact (MIC) forms are issued as requested, and that the MIC form log and correspondence log spread sheet is updated accordingly. They also are required to provide advice on the sampling requirements and provide final sample approval to allow the 'scheme' or item to enter into supply. The MIC form is a critical part of the overall Regulation 31 governance process, on the identification of any work which will introduce a material into contact with untreated or treated water (for example a new scheme, a refurbishment, etc), then contact is required with the Risk and Optimisation team. A link to an MIC form with a unique reference number will be issued.

Instructions are clear for one MIC form per scheme; if there are multiple parts to the scheme then the MIC form should be broken up onto different tabs or clearly sectioned out on Part A of the form.

Details of **all** materials to be used in contact with treated or untreated water must be recorded on an MIC Form, (this includes like for like replacement); the form is split into three parts, materials must be listed in Part A, agreed sampling requirements should be listed in Part B and the sample results, following installation of the materials, in Part C.

Only when Parts A, B and C are approved can the materials enter public supply. An example of the completion of part A of the MIC form is provided below:

PART A - Approvals

Line No.	Supplier	Manufacturer holding approval (if different from supplier)	Product name	Brief Description of material in contact with water (e.g. pump, pipe, sealant)	Large/ Small surface area	Approving body (DWI/ BS6920/ WRAS/ KIWA/ BSEN)	Approving body ref	Have the Instructions for use (IFU) or conditions for use been checked and can you meet all the requirements?	1 Person completing the work Sign/Date	2 Risk Scientist – Materials Approved Sign/Date	Comments and Advice
1	CRL	Fosroc	Nitoseal MS600	joint sealer to seal hatch cover	small	WRAS	1404529	yes	[redacted]		WRAS approved when cured for 21 days at 7°C (see IFU CWSIB: Yr4 May 2014)
2	CRL	Fosroc	Primer MS2	primer to adhere joint sealer	small	WRAS	1404529	yes			WRAS approved when cured for 21 days at 7°C (see IFU CWSIB: Yr4 May 2014)
3	CRL	Vandex international ltd	Cemline & Vandex plug	joint fill and water stop	small	WRAS	1609503	yes			Cure both for 21 days@ 7°C. If the mixing and/or curing conditions are varied from those specified on the approval then the materials are not covered by the scope of the approval
4	CRL	BASF	Masterseal 930/933	joint over banding	small	DWI	56/4/144	yes			This product must be cured for a minimum of 10 days at a minimum temperature of 7°C or in accordance with the cure curve provided in the manufacturer's instruction for use document
5	CRL	brough Sheet Metals	Stainless steel 316L plates	Stainless steil plate fixed to	small	DWI	annex 3c	yes			
6	CRL	Natural cement distribution Ltd.	Natcem 35	Cement Plug (covered with Masterseal overbanding)	small	DWI	56/4/1090	yes			
7											

Figure 1; MIC Form part A for Steeple Bumpstead reservoir remedial work.

The minimum sampling requirements following installation of materials is detailed within Appendix 2 – 'sampling requirements' of this procedure; an overview of the process is provided below.

Following completion of the, flushing and disinfection, and before the item is introduced to public supply, (appropriate) and representative samples must be taken. Samples must be taken following an appropriate stand time (this is typically a maximum of 16 hours however further guidance is included within appendix 2) and analysed for the parameters listed in appendix 2 of this procedure. Only by prior agreement with the Water Quality Risk team can anything less than the defined suite of samples be taken. Part A on the form must also be marked as complete before moving onto the sampling requirements and analysis.

Samples analysis includes taste, odour, microbial growth as well as other parameters such as pH, colour, turbidity, conductivity, alkalinity and trace organic screening.

Submission of the MIC Form parts B and C confirms that the materials listed in part A of the form have been used and that appropriate samples and analysis have been completed. Parts B and C of the form should be signed by the person completing the work to confirm that the samples have been taken from a representative location. A Water Quality Risk Scientist will then sign to confirm the samples are acceptable for use in public supply.

The Water Quality Risk team will verify the results and confirm whether the water quality associated with the asset is of an acceptable standard for use in public supply.

Clear guidance is provided in flowchart 1 of this procedure to complete part A of the MIC form ensuring all materials to be used are listed and evidence of their compliance with Regulation 31 by the way of approval number or British or European Standard number, or BS6920 test report is also listed.

Additional advice is provided within appendix 1 of this procedure to provide further clarity on identifying if the material has a small surface area and is included within DWI Advice Sheet 8 - small surface area products (Regulation 31(4)(b)), and is included within the exemplar list. Further information on large surface areas items are provided along with the requirement if there is still uncertainty around if the material is a large or small surface area, here there is a requirement for a risk assessment to calculate the surface area in contact with water, the volume of water and the time the material is in contact with water. The advice is for the calculation to be used if the product is not listed on the

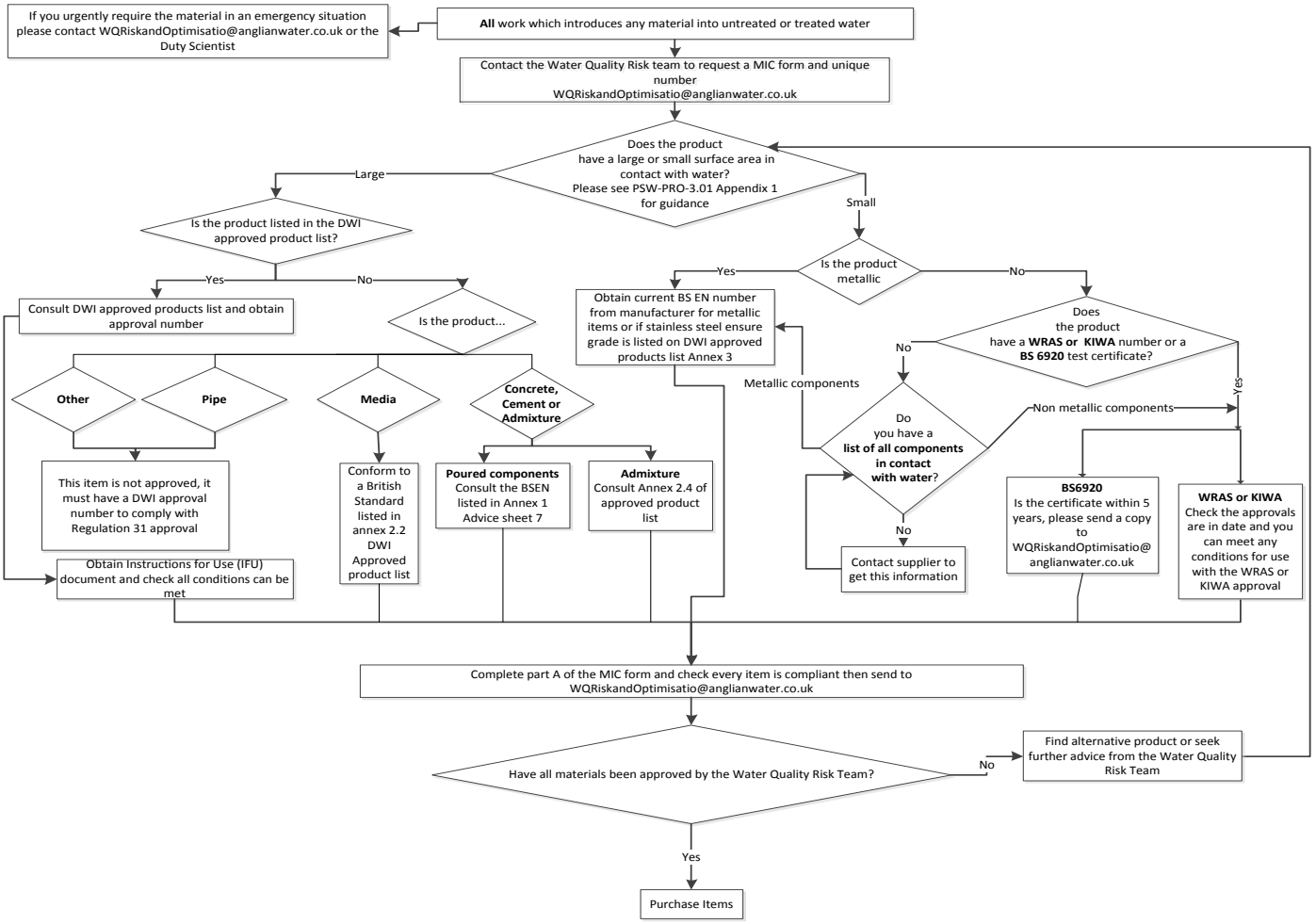
full list of small surface area items as per Advice Sheet 8, or if the product is on the list, but is being used in a different way.

It is a requirement to undertake a different calculation where materials are being used multiple times on a system, and additional advice must be sought from the Water Quality team in this situation.

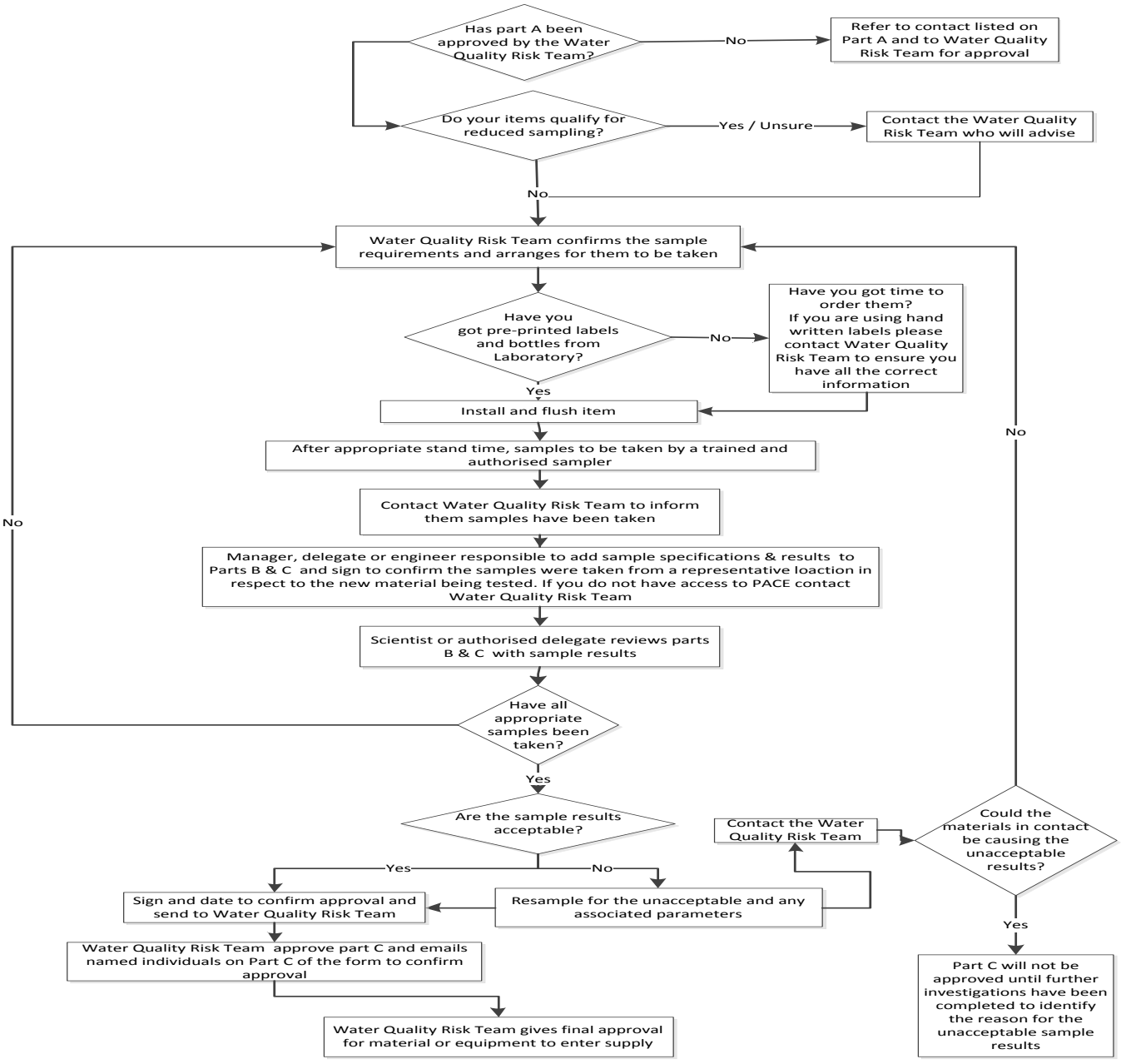
The risk assessment is now assessed at a panel level as part of our Regulation 31 steering group; further detail is provided on this steering group in this paper. Additionally to the risk assessment calculations, we will also look at the materials, and ask the question if similar materials are approved already, we might undertake a soak test and collect our own samples, we look at the reasons why we have to use these products for example is nothing else on the market.

The responsibility of the Supply Chain professional within this procedure is to ensure that all materials with framework agreements are fully compliant with Regulation 31 and evidence has been obtained. Additionally there is the requirement to ensure that the Water Quality Risk team has reviewed all documentation prior to awarding or renewal of a contract this contains items covered under Regulation 31. This is to ensure that framework suppliers know their responsibilities to supply Anglian Water with compliant materials, products and items.

Flow chart 1 below provides a detailed overview of the materials approval process for materials in contact with water for part A of the MIC form. Flow chart 2 provides an overview of parts B and C of the form which details the sampling requirements and the sampling results. Note that these charts are included within the MIC procedure to add further clarity to the process.



Flowchart 1 – Part A: materials approval process for materials in contact with water.



Flowchart 2 - Approval process for part B and C of the MIC form which covers the materials in contact sample requirements and approval of results and sign off for approval for the material or equipment to enter into supply.

PSW-PRO-3.02 Delivery and management of bulk and containerised chemicals (including fuel);

The purpose of PSW-PRO-3.02 Delivery and management of bulk and containerised chemicals (including fuel) within water services is to ensure that fuel and bulk / containerised chemicals of the correct specification (ensuring compliance with BS:EN) are delivered in a safe manner to the correct delivery or storage point. And to prevent the unintended use of incorrect chemicals and inappropriate use of empty and part used chemical containers. The scope of the procedure covers the Water Services Business Unit, the Operational Management Centre Duty Managers and Integrated Supply Chain.

Responsibilities are clearly defined for key roles involved within the 'Delivery and management of bulk and containerised chemicals (including fuel)' within our water business stream. Those key roles are provided below:

- Supply Chain Management
- Supply / Network Service Manager
- Water Quality Scientist
- Works / Network Technician.

Responsibility lies within our Supply Chain Management (SCM) to ensure all chemicals intended for use in public water supply under an SCM chemical contract are compliant with both the relevant and current recognised standard for the chemical (for example BS:EN), and also Regulation 31 of the Water Supply (Water Quality) (Amendment) Regulations 2018.

It also includes responsibilities for our Supply and Network Service Managers to ensure that the procedure is implemented for all chemical and fuel deliveries, with appropriate supervision of delivery drivers by competent staff. Works and Network Technicians have to be deemed competent to accept the chemical or fuel delivery, and are required to ensure that the procedure is followed both prior to acceptance of and during the delivery.

Site specific electronic delivery log templates must be produced for every water supply asset which requires process chemicals and or fuel to be delivered to site, this requires the population of the Water Services chemical and fuel delivery log form 1 part 1. An example is provided below of the log form 1 part 1 for chlorine.

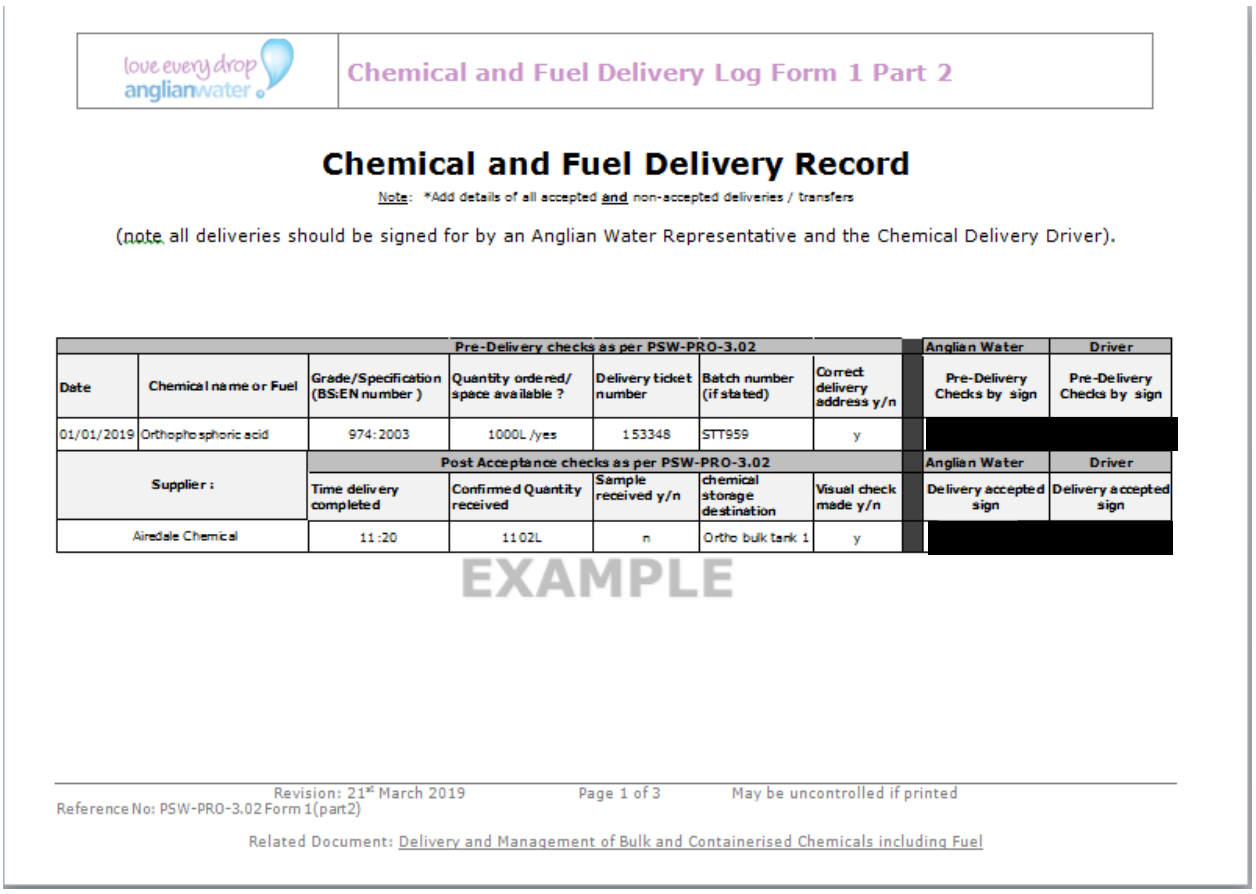
Process Chemicals Used on Site

Chemical Name:	Chlorine	
Chemical Formula:	Cl_2	
Chemical Delivery Format:		
Concentration:	N/A	%
Grade **BS:EN Number**	937:2016	
Number of Tanks:		
Total Capacity Stored:		
Re-Order Trigger:		
Re-Order Quantity:		
Sample Required?	No	
Visual Checks Required?	No	

Figure 2 POSWSH section 3; Chemical and fuel delivery log form 1 part 1, showing the template for Chlorine.

A record of the delivery is to be completed on the site specific Water Services chemical and fuel delivery log form 1 part 2.

An example of the log form 1 part 2 and the corresponding blank record form is provided below:



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Chemical and Fuel Delivery Log Form 1 Part 2

Chemical and Fuel Delivery Record

Note: *Add details of all accepted and non-accepted deliveries / transfers

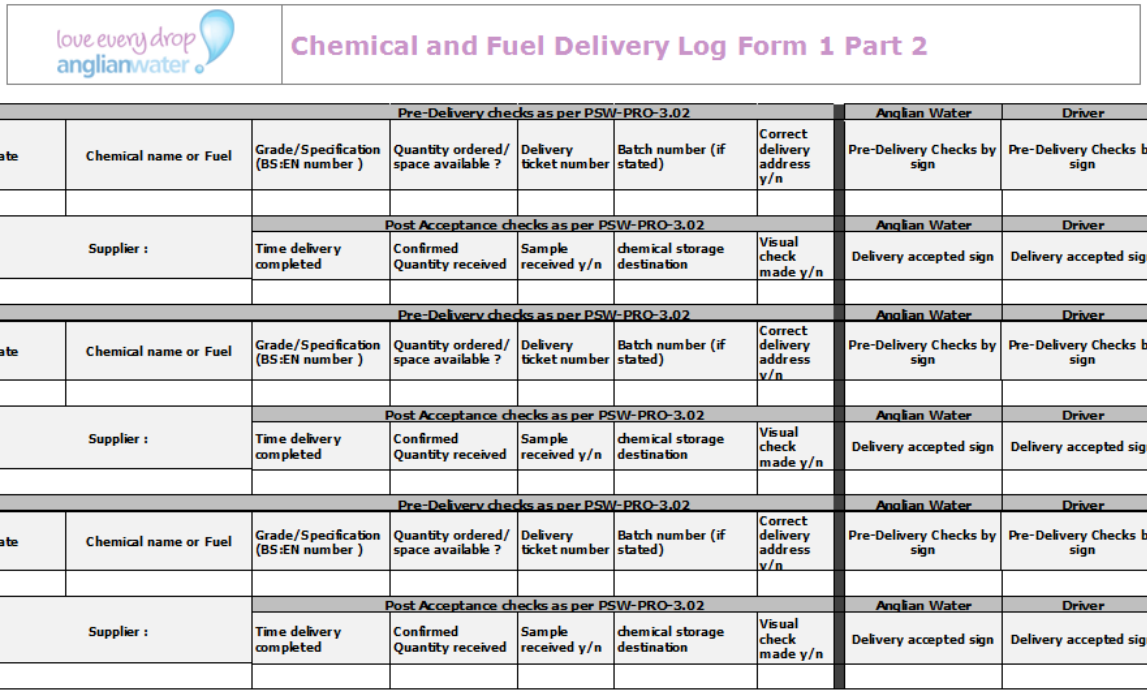
(note all deliveries should be signed for by an Anglian Water Representative and the Chemical Delivery Driver).

		Pre-Delivery checks as per PSW-PRO-3.02					Anglian Water	Driver
Date	Chemical name or Fuel	Grade/Specification (BS:EN number)	Quantity ordered/ space available ?	Delivery ticket number	Batch number (if stated)	Correct delivery address y/n	Pre-Delivery Checks by sign	Pre-Delivery Checks by sign
01/01/2019	Orthophosphoric acid	974:2003	1000L /yes	153348	STT959	y	[redacted]	[redacted]
Supplier :		Post Acceptance checks as per PSW-PRO-3.02					Anglian Water	Driver
		Time delivery completed	Confirmed Quantity received	Sample received y/n	chemical storage destination	Visual check made y/n	Delivery accepted sign	Delivery accepted sign
Airedale Chemical		11:20	1102L	n	Ortho bulk tank 1	y	[redacted]	[redacted]

EXAMPLE

Revision: 21st March 2019 Page 1 of 3 May be uncontrolled if printed
Reference No: PSW-PRO-3.02 Form 1(part2)

Related Document: Delivery and Management of Bulk and Containerised Chemicals including Fuel



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Chemical and Fuel Delivery Log Form 1 Part 2

		Pre-Delivery checks as per PSW-PRO-3.02					Anglian Water	Driver
Date	Chemical name or Fuel	Grade/Specification (BS:EN number)	Quantity ordered/ space available ?	Delivery ticket number	Batch number (if stated)	Correct delivery address y/n	Pre-Delivery Checks by sign	Pre-Delivery Checks by sign
Supplier :		Post Acceptance checks as per PSW-PRO-3.02					Anglian Water	Driver
		Time delivery completed	Confirmed Quantity received	Sample received y/n	chemical storage destination	Visual check made y/n	Delivery accepted sign	Delivery accepted sign
		Pre-Delivery checks as per PSW-PRO-3.02					Anglian Water	Driver
Date	Chemical name or Fuel	Grade/Specification (BS:EN number)	Quantity ordered/ space available ?	Delivery ticket number	Batch number (if stated)	Correct delivery address y/n	Pre-Delivery Checks by sign	Pre-Delivery Checks by sign
Supplier :		Post Acceptance checks as per PSW-PRO-3.02					Anglian Water	Driver
		Time delivery completed	Confirmed Quantity received	Sample received y/n	chemical storage destination	Visual check made y/n	Delivery accepted sign	Delivery accepted sign
		Pre-Delivery checks as per PSW-PRO-3.02					Anglian Water	Driver
Date	Chemical name or Fuel	Grade/Specification (BS:EN number)	Quantity ordered/ space available ?	Delivery ticket number	Batch number (if stated)	Correct delivery address y/n	Pre-Delivery Checks by sign	Pre-Delivery Checks by sign
Supplier :		Post Acceptance checks as per PSW-PRO-3.02					Anglian Water	Driver
		Time delivery completed	Confirmed Quantity received	Sample received y/n	chemical storage destination	Visual check made y/n	Delivery accepted sign	Delivery accepted sign

Figure 3 POSWSH section 3; Chemical and fuel delivery log form 1 part 2.

The Works and Network Technicians must check that the specification for the delivered chemical exactly matches the approved specification, as described in Table 1 of this procedure.

The requirement to undertake visual checks (at the point of use) of the chemical and sampling requirements are detailed within Table 1 of this procedure.

The review in March 2019 required the inclusion of the Works Technicians responsibilities to only take delivery of one chemical at a time and supervise the disconnection and reconnection of all containers (i.e. multiple IBC's).This followed internal audit and subsequent areas identified for improvement.

The above detail is not exhaustive in terms of the requirements of the section 3 procedures and the key roles and responsibilities there within, therefore a copy of the above procedures are provided with this submission.

There is strong governance around the policy, standards and procedures within POSWSH and the review and approval process of these documents.

Compliance with Regulation 31 – Regulation 31 Steering Group

The Regulation 31 Steering Group has been founded to minimise the risks associated with materials in contact within the business and as a focal point for the continuous improvement of our processes.
Outputs from this group include escalation of relevant issues to the Water Services Compliance Monitoring Group (WSCMG), and notifying relevant steering groups or stakeholders of current or emerging issues.

This is a monthly meeting, and has a rotating chair of subject matter experts from the Water Quality Risk team, who have overall day to day responsibility of the management of Regulation 31 within the company. Key membership includes the Water Quality Risk and Optimisation Manager, the Water Quality Risk Managers (East and West), the Risk Scientists, the Senior Strategy Scientist, the Regional Manager - Integrated Operational Solutions (IOS), Project Engineers from IOS and representatives from our @one Alliance partners. Subject matter experts are invited as appropriate for example key representatives from the Supply and Network teams.

An overview of the responsibilities of the steering group is detailed below:

- Ownership of the continuous improvement of the MIC process.
- The requirement to fully embed Regulation 31 requirements within the company.
- To identify and resolve emerging issues.
- To share and disseminate company and industry learning.
- To promote awareness and support with the development of Regulation 31 training.
- To ensure regulatory updates are embedded within the relevant company procedures and to ensure compliance with Regulation 31.
- To sign off the risk assessment approvals process.

The first meeting of this group was held on 30 May 2019.

Integrated Operational Solutions (IOS) are responsible for small works capital delivery within Anglian Water, for example the delivery of our reservoir and tower maintenance and refurbishment programme.
Under the recent Business Operating Model (BOM) changes which have been implemented in April of this year, IOS have been brought into the Water Services business stream and the new role of Regional Manager – IOS has been created. The aim of this restructure and move into water services was to ensure integration of IOS into the operational teams. The Regional Managers role is to ensure efficient delivery of the small capital delivery process, and has responsibility for the management of Regulation 31 compliance within the delivery process.

The Project Engineers within IOS, which attend the steering group, have the portfolio of Regulation 31 champions within the IOS team. As subject matter experts, they have responsibility to disseminate best practice within the IOS team.

The @one Alliance is our Integrated Main Works delivery partner framework, and are responsible for AMP6 capital delivery schemes. Key representation from this delivery route attended the steering group meeting in September; this included the attendance of the Product-Based Delivery Engineer (Anglian Water @one Alliance) who also has a dual role of Standards & Products Engineer (Anglian Water Asset Delivery). Again as subject matter experts, they have responsibility to disseminate best practice within the @one Alliance delivery route.

The creation of the steering group allows us to manage the continual improvement of our MIC process. Process improvements identified by the steering group to date include:

- The continual improvement of procedures.
- Updates to training; we are currently undertaking a review of our Regulation 31 training and awareness modules, with the aim of simplifying the training material. The full day classroom training and E – learning training are being reviewed, further detail is provided later in this paper.
- Further development of our communications and awareness approach of Regulation 31 requirements.
- Review of any audit findings related to Regulation 31 and tracking of actions.
- The on-going development of a master list of regularly used products are to be made available to the business, the aim of which is to simplify what is currently sometimes perceived to be a complex search system. This is to be supported with the management of regular updates to this list.
- Approval of Regulation 31 risk assessments; this has introduced a requirement for all Regulation 31 risk assessments to be approved at the steering group. The previous process was undertaken by a Risk Scientist and signed off by the Risk

Manager, whilst the process was robust the refined process allows for the risk assessment to be reviewed by the panel of subject matter experts. The risk assessment still requires to be signed off as approved by the Risk Manager.

Compliance with Regulation 31 – the role of Water Services Compliance Monitoring Group (WSCMG)

Our Water Services Compliance Monitoring Group (WSCMG) monitors on-going compliance with regulatory water quality, environmental and related parameters, progress against internal programmes of work affecting water quality and water services asset serviceability measures.

WSCMG also reviews a wide-ranging suite of parameters directly or indirectly affecting water quality, including key performance indicators which help to ensure that the Water Services quality management system continues to achieve its intended outcome and meets ISO 9001 management review requirements.

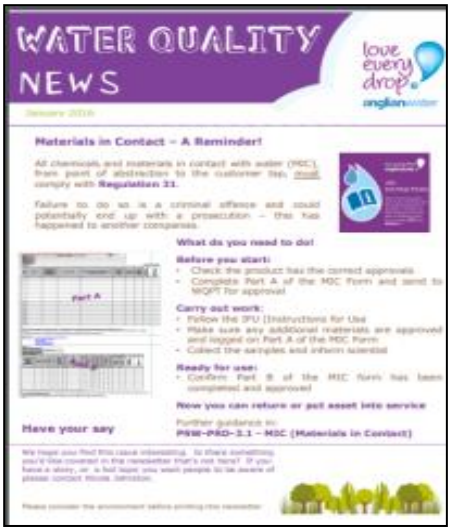
Outputs from this group include escalation of relevant issues to the Water Quality and Environmental Compliance Group (WQECG), and notifying relevant steering groups or stakeholders of current or emerging issues.
Further information on our WQECG is provided for completeness [1].

This is a monthly meeting, chaired by the Head of Water Quality and has key membership which includes the Director of Water Services, the Water Quality Management team, and the Regional Managers in Supply and Networks.

We have introduced a 'could it happen here' process where industry learning is reviewed to learn from recent industry events or near misses; this is presented at WSCMG as and when appropriate. This process includes a review against our own systems and processes. For example , a 'could it happen here' - Regulation 31 prosecution was discussed in February 2019, following the Instructions For Use not being adhered to during the application of a lining material to a storage point.
This resulted in us undertaking an internal audit of a couple of storage points which were undertaking refurbishment with the scope to cover the use of correct materials, the quality of work carried out was to the correct standard and that appropriate records were in place.
These were completed in February and April 2019, a satisfactory audit was recorded.
There were areas identified for further development for example the reservoir and tower coating record information logs were identified with blanks in non relevant boxes. Those employees completing the records have been made aware that the record form must be fully completed to include 'not applicable'. Additionally there was an action to ensure that the IFU's are within the site 'yellow quality' folders. Further detail on the yellow quality folder and the reservoir and tower coating record sheet is provided later in this paper.

Industry learning and events related to Regulation 31 continue to be highlighted through this process, with a commitment to take action on areas identified for further review, development or where additional risk mitigation is required. Progress against completion of actions is tracked as part of our internal audit programme and is reported against at this group. Any internal potential near misses are also brought to this group.
It must be noted that learning from Southwick tower taste and odour event was brought to the WSCMG and an action plan produced, this was prior to the introduction of the 'could it happen here' process which we currently refer too.

This group directs specific communication to be provided to the relevant teams in relation to key lessons or areas of potential concern. These can be through various channels of communication , however typically this can be through Water Quality news flash updates (which the contents are approved through the Water Quality Policy and Strategy Manager), or Team Talk which is managed by the Change team.


WATER QUALITY NEWS

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Materials in Contact – A Reminder!

What do you need to do!

Before you start:

Carry out work:

Ready for use:

Now you can return or put asset into service

Have your say

Further guidance in:

PRW-PRO-3.1 – MOC (Materials in Contact)

Figure 4; A water quality news flash covering a refresher update on the requirements of materials in contact and completion of the MIC form.

[1] WQECG -This meeting is held every Tuesday and is attended by the Chief Executive, the Director of Water Services, the Director of Water Recycling, the Head of Water Quality, the Head of Environmental Quality, the Head of Tactical Operations, the Assistant Regulation Solicitor and is chaired by the Head of Risk and Resilience.

Supply Chain Framework supplier assurance and the performance monitoring process

Compliance with Regulation 31 within our framework contracts are managed through the supplier tendering, evaluation and selection processes which ensure selected suppliers are capable of meeting Anglian Water and Regulation 31 requirements and are committed to do so. Materials in Contact and product traceability requirements are built into the framework contracts.

We have undertaken a number of initiatives over the last couple of years to provide assurance internally of compliance with Regulation 31 and also following identification of areas for improvement. Our Director of Water Services held a supplier summit with all chemical suppliers to highlight key aspects of assurance we required from them (for example compliance to BS:EN) as a consequence of the GAC contamination issue in 2017. This was a direct action from the identification of potential areas for improvement identified through the audit undertaken following that issue. The Inspectorate attended this summit day.

We launched the "Chemicals in Contact Assurance" document at this event, which re-enforced the standard, confirmed our intention to audit and included the requirement for suppliers to highlight any changes to their products or processes. Every supplier signed up to this. The requirement to highlight any changes to products or processes fed, and continues to feed into our risk based approach specifically developed to auditing the chemical contract suppliers.

A copy of the Chemicals in Contact Assurance document is provided with this submission.

Assurance of key performance measures for chemical suppliers is proactively sought, on a monthly basis, via an electronic questionnaire which suppliers have to respond to, (this was also launched on the summit day). This includes confirming if there have been any changes to product manufacturing processes, raw material changes, continuity of supply etc. A positive monthly response is required even if nothing as changed. A copy of the electronic monthly response questionnaire is provided with this submission.

As part of our commitment to continual improvement we are currently working on replicating this process for our material suppliers. All material suppliers have been sent a materials compliance Regulation 31 questionnaire, a copy of the questionnaire is provided with this submission.
These material supplier questionnaires are currently being scored; this will feed directly into our risk based approach to further inform and develop the auditing programme for the material contract suppliers.

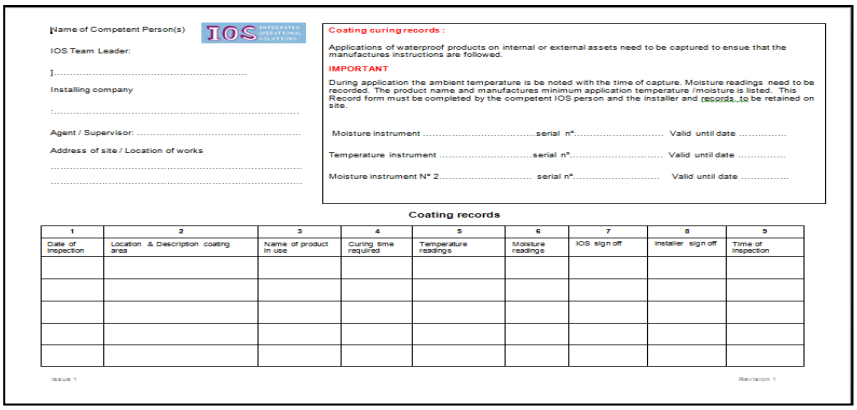
All suppliers of potable water treatment chemicals were audited across 2017 and 2018 (with some being audited more than once), this was utilising a multi-disciplinary team which included representatives from Lloyds Registration Quality Assurance, the Anglian Water Supply Chain team, the Quality Assurance team and the Water Quality team.

The outputs from these audits have informed this year's audit programme and have allowed for the development of a risk based approach to the frequency of chemical supplier audit going forward based upon audit findings and general assurance, this has lead to the development of a Regulation 31 rolling audit programme of those suppliers.

The development of an on-going risk based audit programme, providing us with greater assurance of our chemical supply chain. Progress and outcomes from the audit programme is monitored at the WSCMG on a monthly basis; any areas of concern around Regulation 31 will be specifically highlighted within the audit programme update report.

Compliance to Instructions for Use within Integrated Operational Solutions (IOS)

In 2017, working collaboratively with our IOS team, we developed a method for them to record and capture key data in relation to Instructions For Use (IFU) compliance, which was briefed out to all relevant staff.
The methodology was specifically developed for the reservoir and tower maintenance programme initially. The reservoir and tower coating records information log, includes the maintenance of IFU information, records of temperature monitoring, coating records, details of surface preparation, and data sheets.
The IOS Project Engineers are required to check and sign-off the forms to provide further assurance of IFU compliance.



Name of Competent Person(s)

IOS Team Leader:

Installing company

Agent / Supervisor:

Address of site / Location of works

Coating curing records :

Applications of waterproof products on internal or external assets need to be captured to ensue that the manufactures instructions are followed.

IMPORTANT

During application the ambient temperature is be noted with the time of capture. Moisture readings need to be recorded. The product name and manufactures minimum application temperature /moisture is listed. This Record form must be completed by the competent IOS person and the installer and records to be retained on site.

Moisture instrument ..... serial n°..... Valid until date .....

Temperature instrument ..... serial n°..... Valid until date .....

Moisture instrument N° 2..... serial n°..... Valid until date .....

Coating records

1	2	3	4	5	6	7	8	9
Date of inspection	Location & Description coating area	Name of product in use	Curing time required	Temperature readings	Moisture readings	IOS sign off	Installer sign off	Time of inspection

Issue 1 Revision 1

Figure 5; The reservoir and tower coating records information log used by IOS.

This also led to the introduction of the 'yellow quality' folder within the reservoir and tower maintenance programme within this delivery route.
The yellow quality folder consists of several sections with relevant information in each, for example the inclusion of quality records, manufactures IFU, data sheets and data logger information. The relevant sections with regards to Regulation 31 are included below:

- Header sheet; this sheet contains details of the site and best contact regarding works taking place at this site.
- Index sheet; this sheet contains an index of each section plus details of the Regulation 31 approval numbers for all products/materials being used on site (the example shown below is from the 'could it happen here' audit at Steeple Bumpstead reservoir). Those highlighted in yellow had been identified as nearing their approval expiry dates.
- Material Storage sheet; this sheet shows storage details of all materials at the site.
- Coating Record sheets; reservoir and tower records coating record sheets are to be kept in the quality folder for all products and materials used on site. These sheets show the values for temperature and moisture (where applicable) plus curing times, each time the material is applied. They also have a diagram page so that a simple drawing of the structure can be noted, showing the locations of where the material has been applied. These sheets are to be completed for all products used on site, both externally and internally.
- Data Logger record information; this includes detail that all materials and products that are applied to the inside of the storage points are used in accordance with their instructions for use, and to ensure cure times and temperatures are met, the

use of continuous data logging is employed. This sheet is to provide assurance and evidence that cure time and temperatures are adhered too as per the IFU requirements.

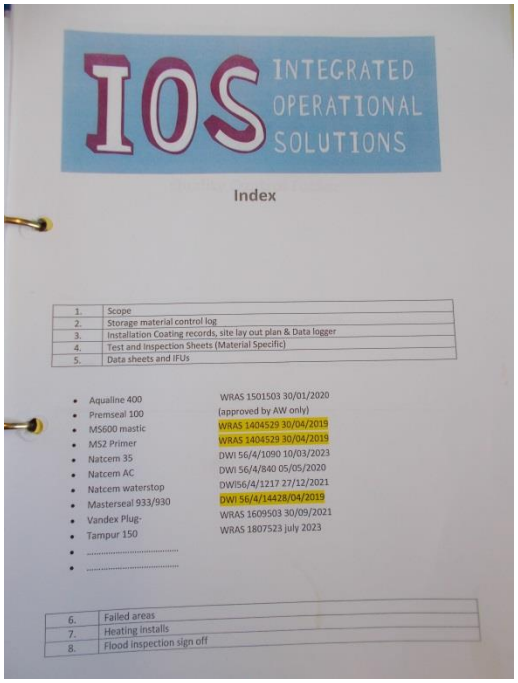


Figure 6; An Example of the index sheet, showing the materials used and the Regulation 31 approval numbers for all products and materials being used on site (example from Steeple Bumpstead reservoir).

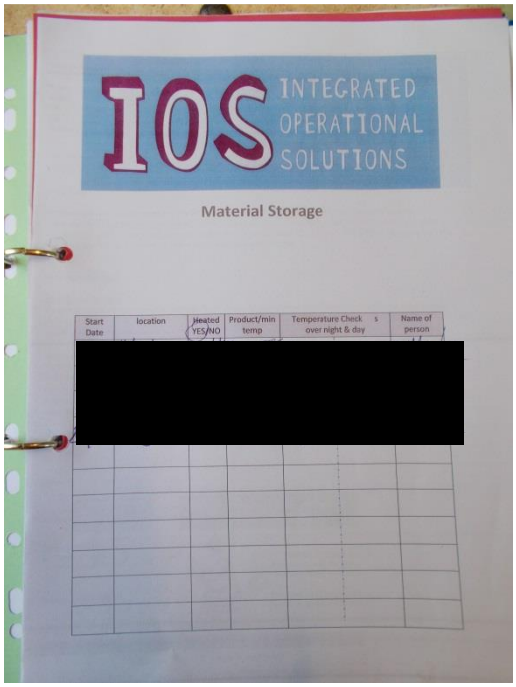


Figure 7; An example of the material sheet, this shows storage details of all materials at the site (example from Steeple Bumpstead reservoir).

In recognition of the additional area of focus, this also led to the creation of an Integrated Operational Solutions Quality Assurance role to carry out additional checks and audits in this area.

We are currently in the process of rolling out the requirement for a yellow quality folder for all of the delivery programmes of work and schemes delivered by IOS. We plan for this to be embedded by the end of March 2020.

Compliance with Regulation 31 within the @one Alliance (Integrated Main Works)

The totex delivery governance process which the @one Alliance must adhere too, includes a number of 'gateways' which are referred to as Delivery Milestones (DM) within the business; there are 7 DM stages in total all of which require formal approval and sign off to move forward to the next delivery milestone (with the exception of DM6 which is the closure of the scheme).

There are a number of key deliverables at each Delivery Milestone, with the completion of the MIC form for all known materials which must be signed off by the Water Quality team at DM3, (DM3 is the confirmation of the delivery solution plan).
We are currently looking into the feasibility of bringing the MIC form completion of part A forward within the governance process with the possibility of this being required at the DM2 (which is the confirmation of the single option) sign off and approval stage. This has been captured as part of the programme of work currently being developed around the review of the delivery governance as part of the Business Operating Model changes and subsequent process reviews.

Additionally specific guidance around Regulation 31 requirements and the approvals process is provided within the Alliance procedure: Guidance Notes – ALL-GUI-TD-003 - water non-infrastructure MIC approvals, flushing, disinfection & sampling. This provides a pro forma of steps which are required as part of the scheme delivery process, along with accountability for responsibility of who within the delivery team is required to complete that step, Regulation 31 training requirements and it also details the relevant POSWSH documents.

The following is an exert from that document;

INTRODUCTION

The following document lists the steps for all WNI projects that install products, materials or processes, which are in contact with water and intended for potable use. These steps must be followed in order.
Each action is assigned a person accountable and responsible, together with a list of people who can assist and any training that is required to carry out the action correctly.
It is vital the actions are programed in, completed in the correct order, and in a timely manner, if plant and equipment are to be allowed into supply by Anglian Water.

Regulation 31 - internal training and awareness

Our training for Regulation 31 currently includes a one day course, WS083 Materials in contact, and an E-Learning course. The material has been specifically designed to address different levels of knowledge regarding the Regulation 31 requirements and what is required as relevant to individual roles within the business.

The one day classroom training course is mandatory for employees who will purchase materials that could fall under Regulation 31.The course covers the requirements of Regulation 31, and the requirement to complete the Materials In Contact form.

The learning objectives of the course are to ensure the attendees have;

- an understanding of the requirements of Regulation 31 and Materials and Chemicals in Contact with Water PSW-PRO-3.01.
- an appreciation of what constitutes large and small surface area materials.
- an understanding and be able to complete Part A of the MIC form: materials approvals process.
- an understanding of why we sample and sampling requirements for MIC.
- be able to competently demonstrate adherence to MIC process.

The course emphasises the importance of the Instructions For Use (IFU) and ensuring all requirements can be met before a product is purchased. The course is designed to empower delegates and give them the skills they need to speak to suppliers about Regulation 31 approvals. When dealing with suppliers, delegates are encouraged to ensure that it is clear from the beginning of the procurement process what Anglian Water expects for approval of items under Regulation 31.

Delegates are encouraged to bring along stories of their experience with materials in contact to discuss amongst the group. At the end of the course applicants must:

- have an understanding of Regulation 31 and how it that is detailed within the POSWSH procedure PSW-PRO-3.1 Materials and Chemicals in contact with water.
- have an appreciation of what constitutes large and small surface area materials and the associated risk assessment process requirements to ascertain the surface area in contact with water.
- be able to recognise all parts of the MIC approval form and be able to complete part A of the form.
- have an understanding of why we sample and the sampling requirements of the MIC process.
- be able to competently demonstrate adherence to the MIC process.

The course ends with an assessment at the end of the day to demonstrate understanding of the Regulation 31 requirements and the governance process within Anglian Water.

To date, the course has been completed by over 200 employees including key partners delivering small capital works delivery and our @one Alliance partners who are responsible for delivering large capital schemes for Anglian Water.

Figures 8, and 9 below show a couple of the slides which are covered within the training module; visual pictures are an important element within our training material. Evidence suggests that the training material resonates better with the attendees when visual aids are used.

Figure 8; large and small surface area approval routes are discussed.

Figure 9; these two photographs are taken from the same system, both are from downstream of a small natural rubber "O" seal, showing the link between inappropriate fittings and the potential for the promotion of microbial growth. This is an example which was provided by a member of the Water Quality team who had been previously on a DWI secondment.

The E-Learning course was introduced in 2018 and was developed to raise the overall awareness of key aspects of Regulation 31 for those employees who are involved in the MIC process but may not be directly involved in the purchasing of those items.
The course includes a description of the MIC process, an overview of the material types and their approval routes, and outlines the different product approval types. It explains the importance of the IFU and also demonstrates the MIC sampling requirements.
A competency test is undertaken at the end of the course and will not be marked as complete until participants have passed the test.

The course is mandatory for all relevant roles (including Network and Supply Technicians), and we have introduced the requirement for a 3 yearly mandatory refresher. To date circa 600 employees have completed the E-learning module.

As previously mentioned we are currently reviewing the training modules with the proposal to develop a simplified training approach. This is to be supported with quick 'hints and tips' user guides. Our Training and Development Business Partner is reviewing this training with our Risk Scientist who leads on Regulation 31. The review of the training modules shall be completed by the end of October and the development of the hints and tips guide completed by the end of December.

<u>Industry development</u>

We are working with Northumbrian Water to develop a Code of Practice for the application of specialist materials to drinking water structures. The purpose of the Code of Practise is that it is adopted by all statutory water undertakers (in England and Wales) and their supply chains to provide assurance to the Secretary Of State in respect of compliance of Regulation 31.

The Code of Practice aims to provide competent parties to apply 'specialist materials' to drinking water structures in compliance with Regulation 31.
The scope of the Code of Practice covers material storage cover material storage, transportation, surface preparation, material application, curing, inspection, return to service requirements and record keeping needed to apply "specialist materials" to structures used for the retention of partially or fully treated water. The roles of the various parties involved in the process are also defined.
This document has been sent to the Inspectorate for comment and feedback has been received.
Additionally this is supported by the proposed development of an EU skills competency framework two meetings have been held to date with EU skills to develop how we assess competency and develop the supporting framework.
This collaborative industry approach is being lead by the Head of Water Quality within Anglian Water and the Head of Water Quality within Northumbrian Water.
A copy of the Code of Practice is included within this submission.

Following advice from the Inspectorate we have consulted the industry on how they manage the Regulation 31 process. Following discussions at the Water UK Strategic group, there is agreement to establish a new industry Task and Finish Group focusing on industry wide Regulation 31 best practise with the proposed aim of developing a 'best practice' document.
The first meeting is to be held by the end of October 2019 and includes Anglian Water, Thames Water, Northumbrian Water, Severn Trent Water, and Southern & South Staffs Water.

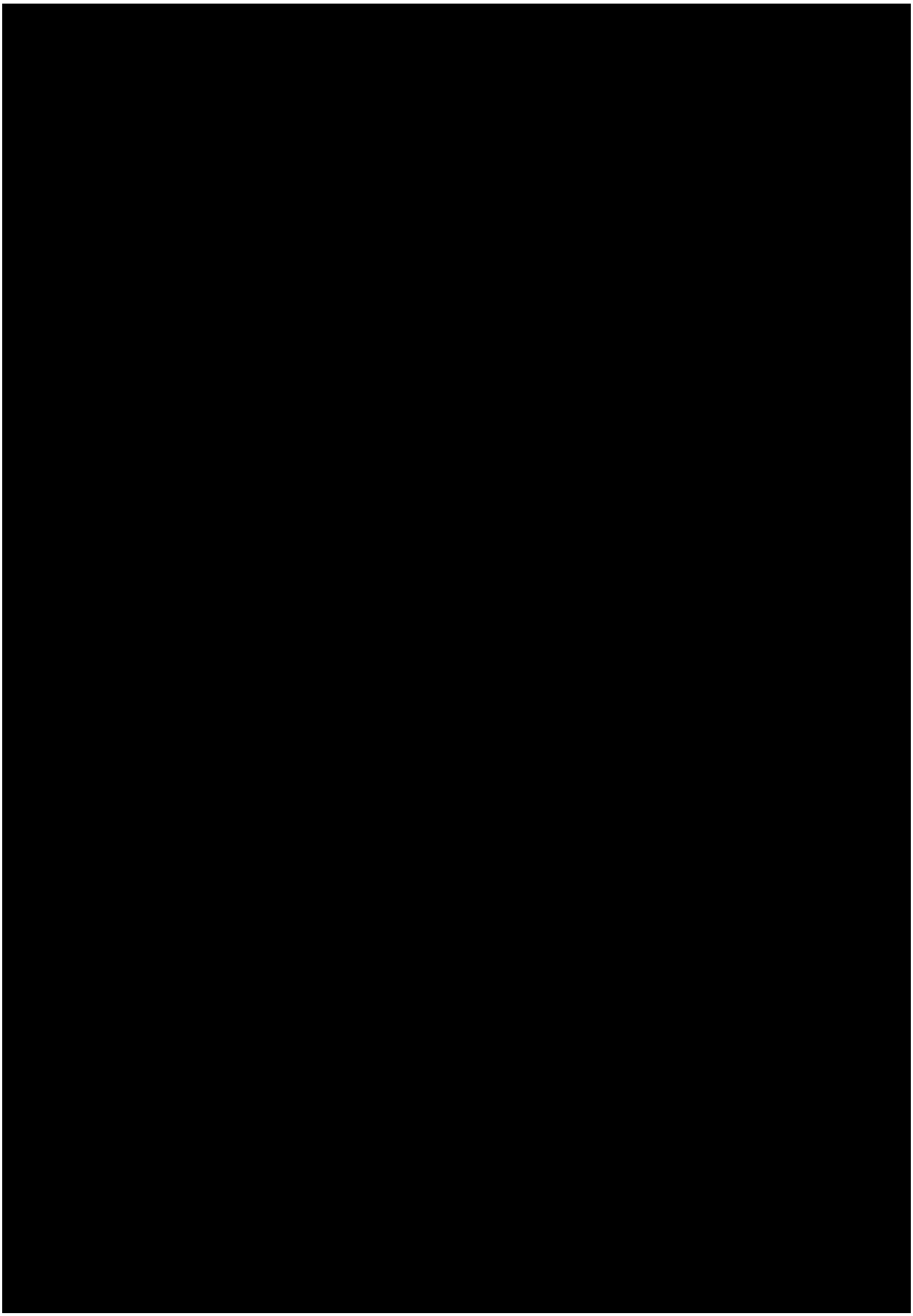
As discussed at the Regulation 31 meeting held 16 September with the DWI, the following items will be included within the agenda for discussion: supplier audits as an industry approach rather than at an individual company level and on-going maintenance requirements as per the IFU requirements. This meeting will be attended by the Water Quality Regulations Manager.

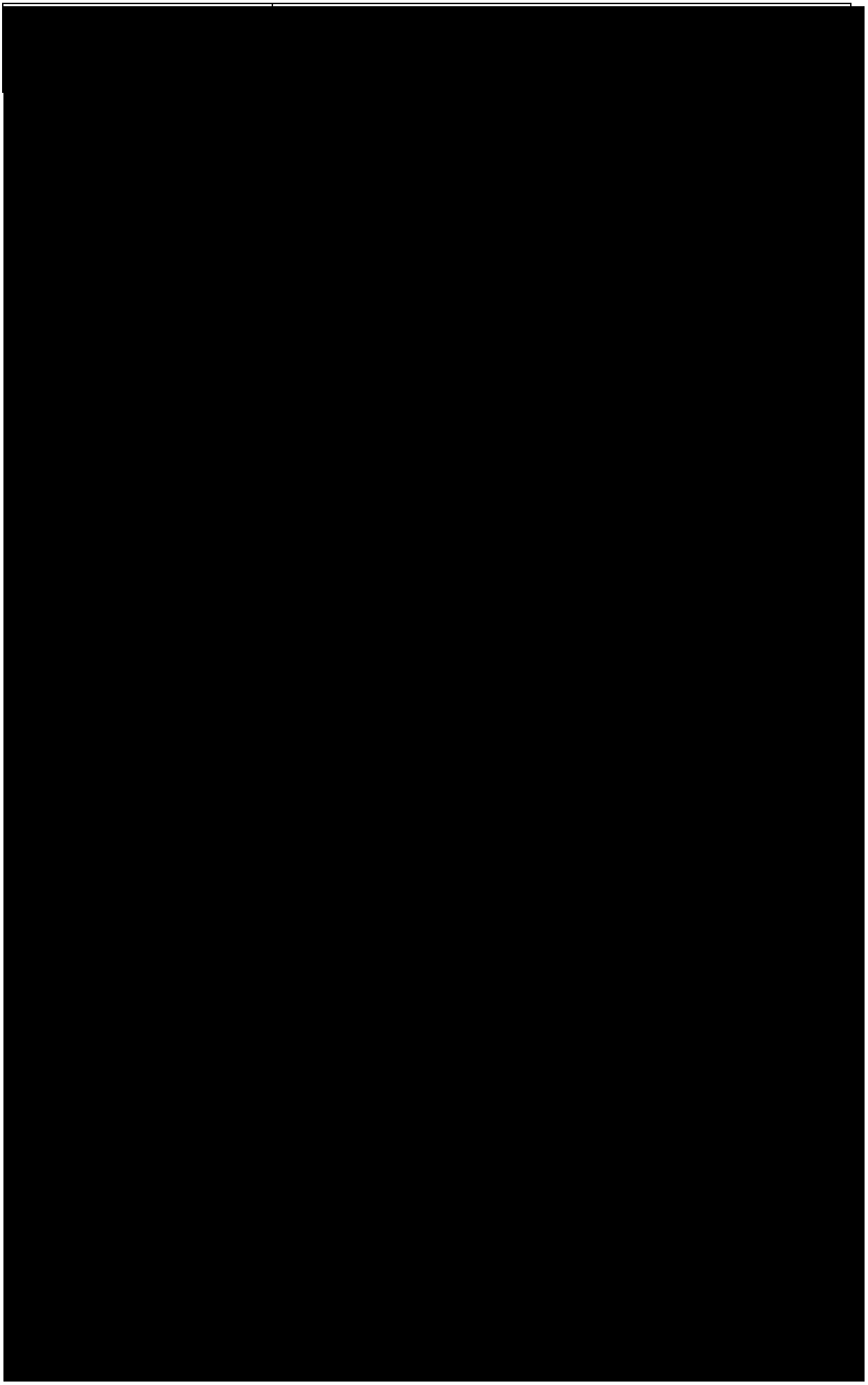
<u>On going continuous development</u>

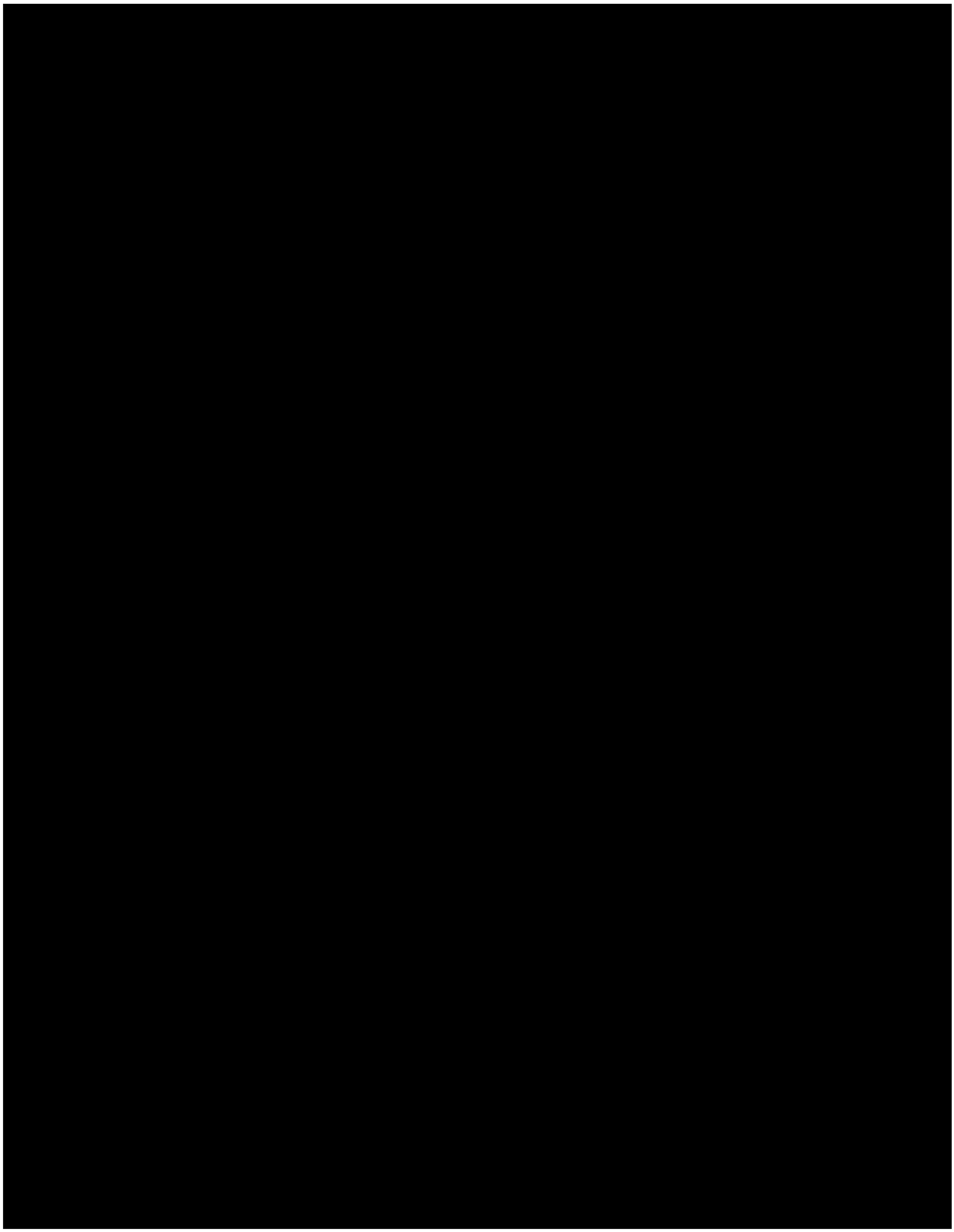
We undertake a continuous on going review and development of our Regulation 31 governance process, a number of those areas have been detailed within this paper.
Some other areas have been identified for development and are included below:

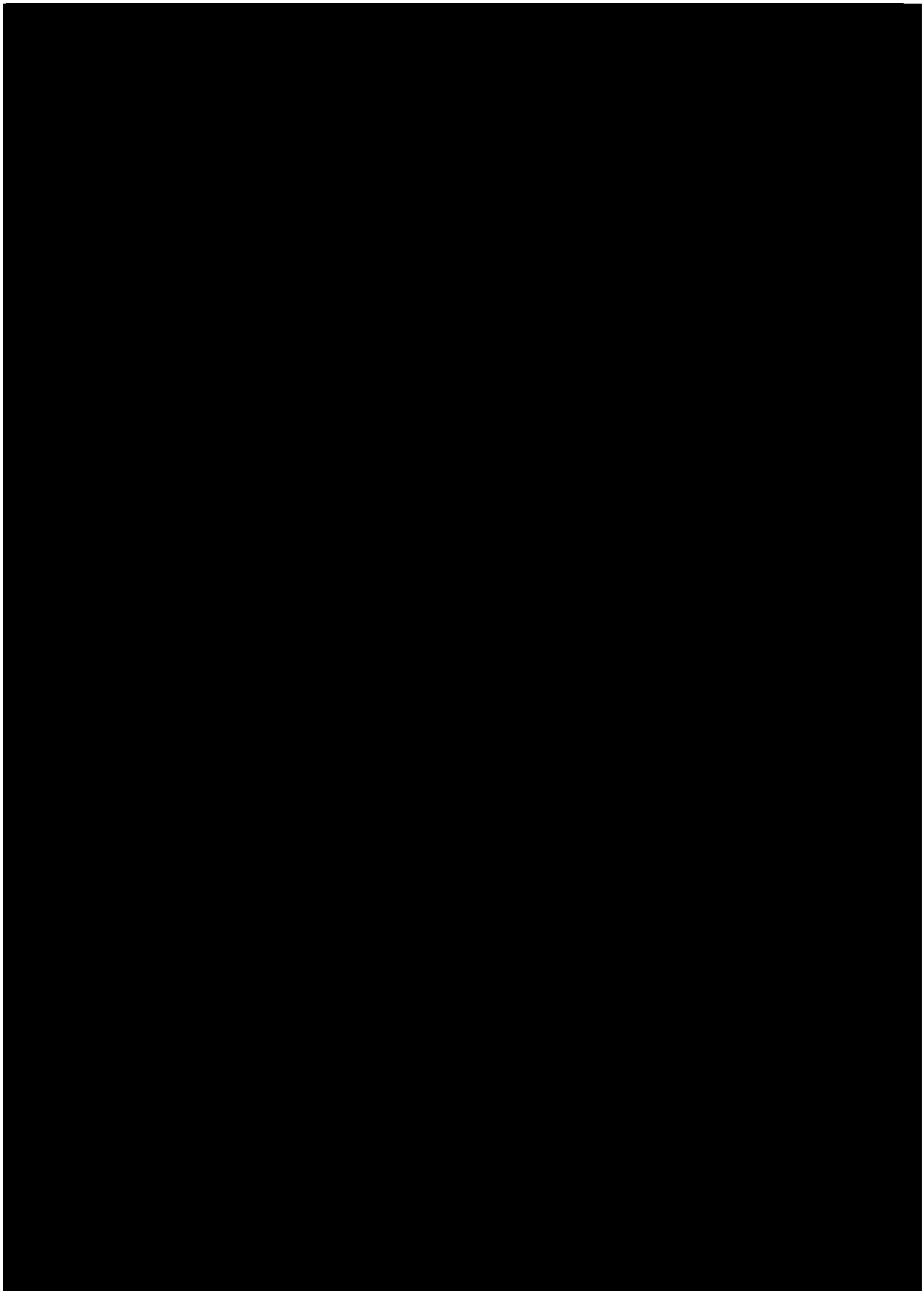
- A review of our training and awareness material in conjunction with our delivery partners with the potential to develop tool box talks.
- To explore the proactive development of an on-going master list of regularly used products with a view to update this on a monthly basis and with notifications to the appropriate teams. The review is to be assigned to a specific role to ensure the monthly update is completed after the 20th of the month (these dates are when the Inspectorate have informed us that they update the approvals list).
- Explore the potential for an IS Solution to aid the MIC process and improve efficiency, for example the development of a MIC portal.

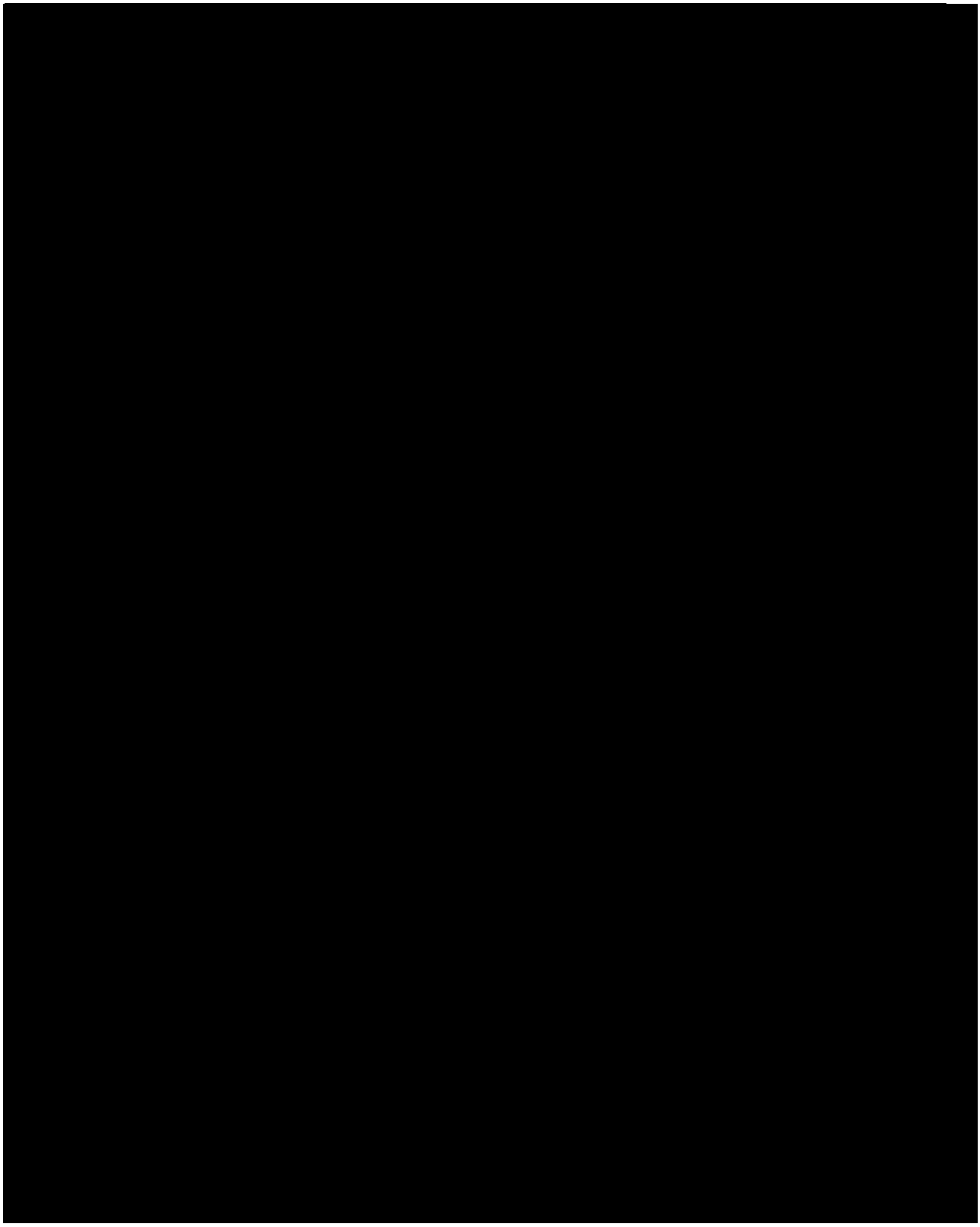
There is strong governance with regards to Regulation 31 within Anglian Water; developments have been introduced and areas highlighted for further development as part of the review of the governance process and management thereof. Further update will be provided to those areas highlighted within this paper in the progress reporting requirements.

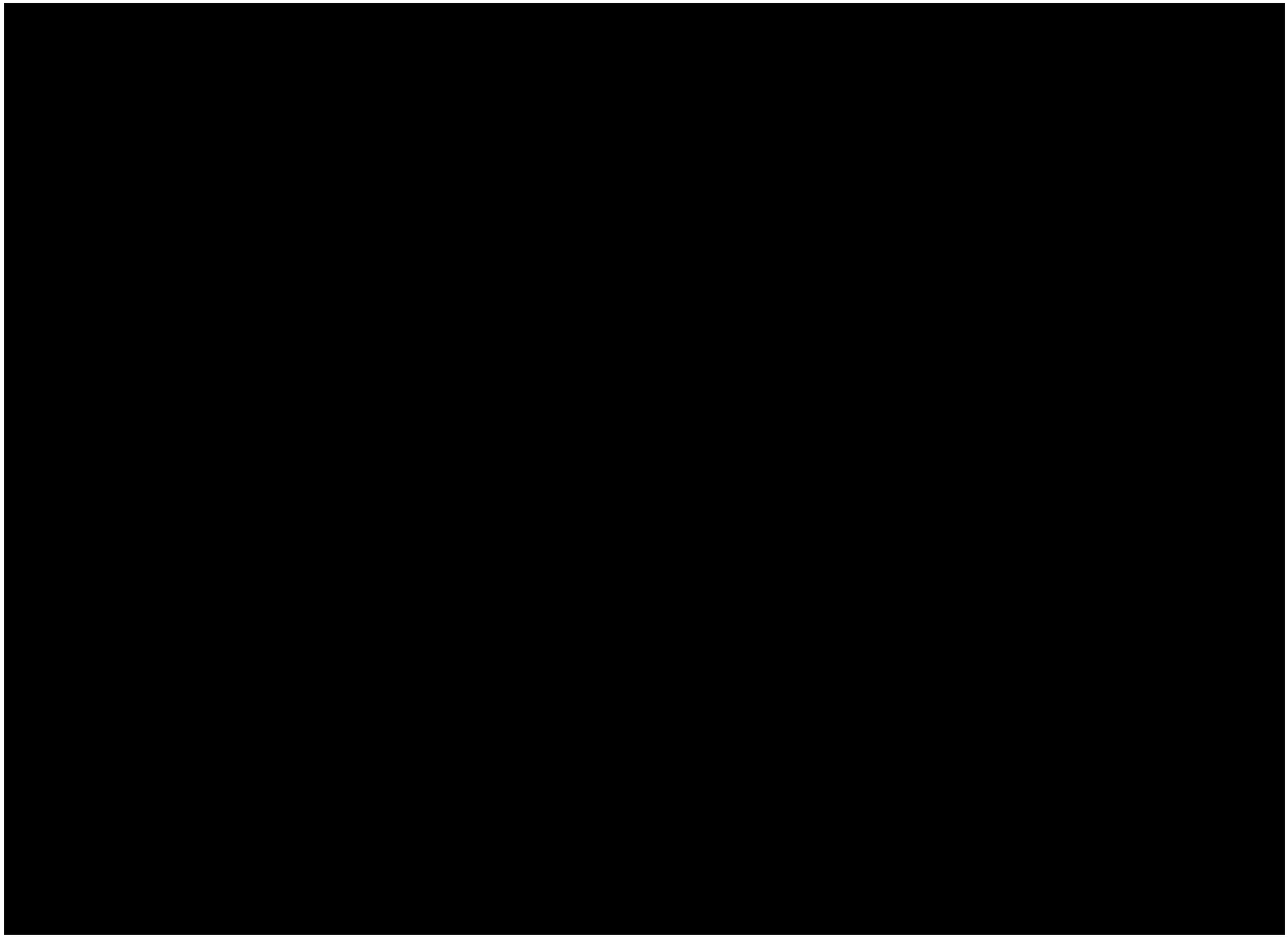


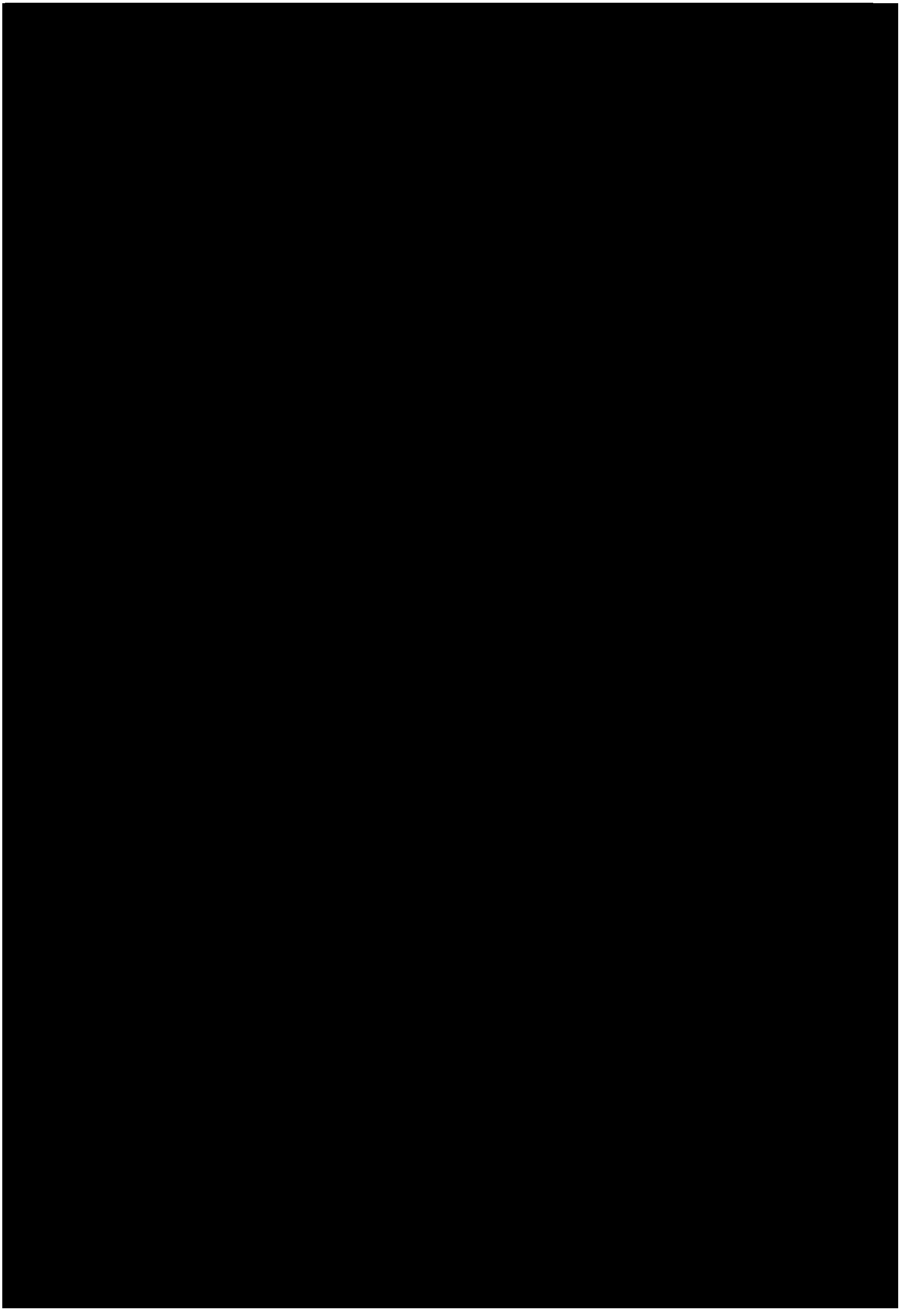


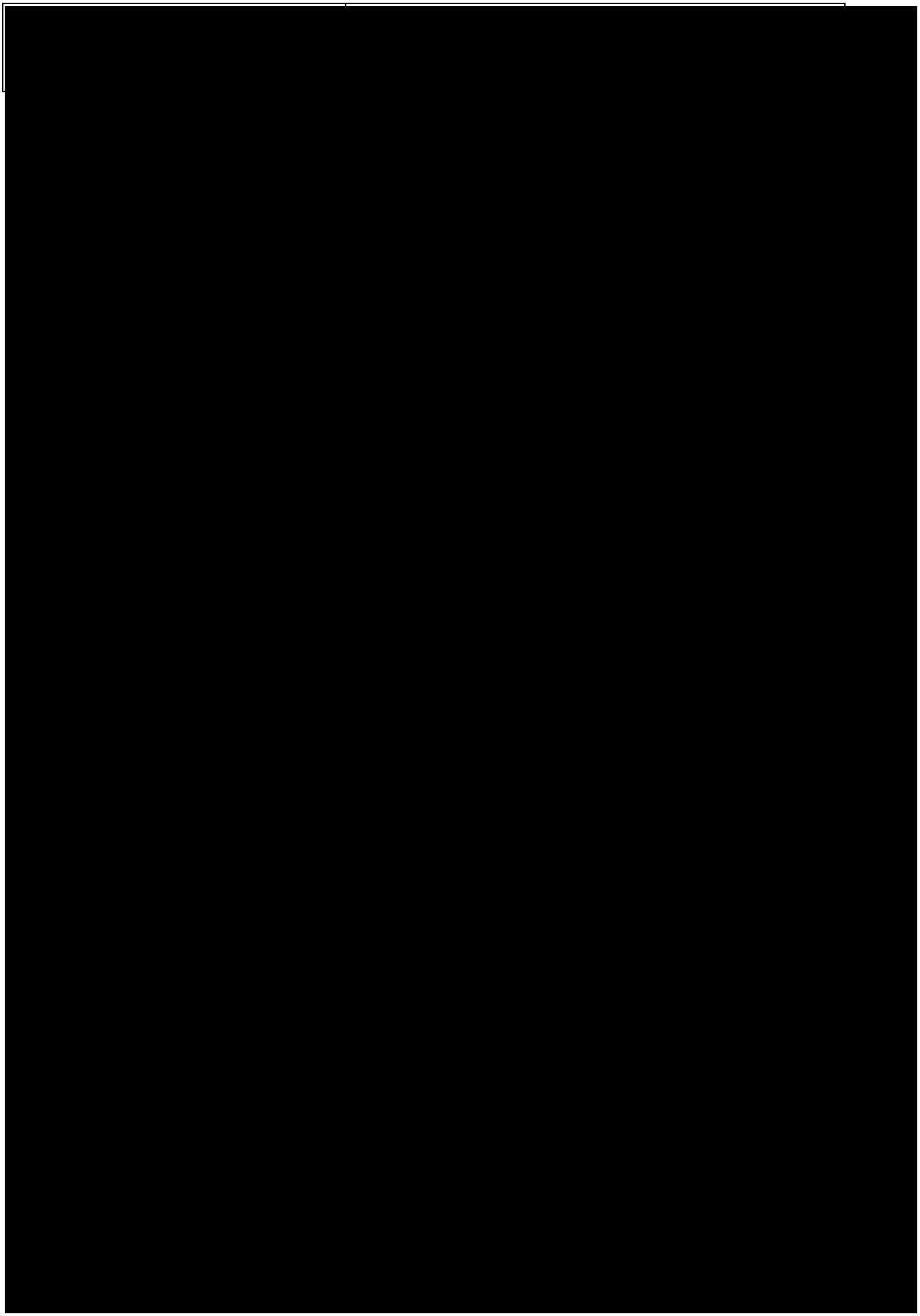












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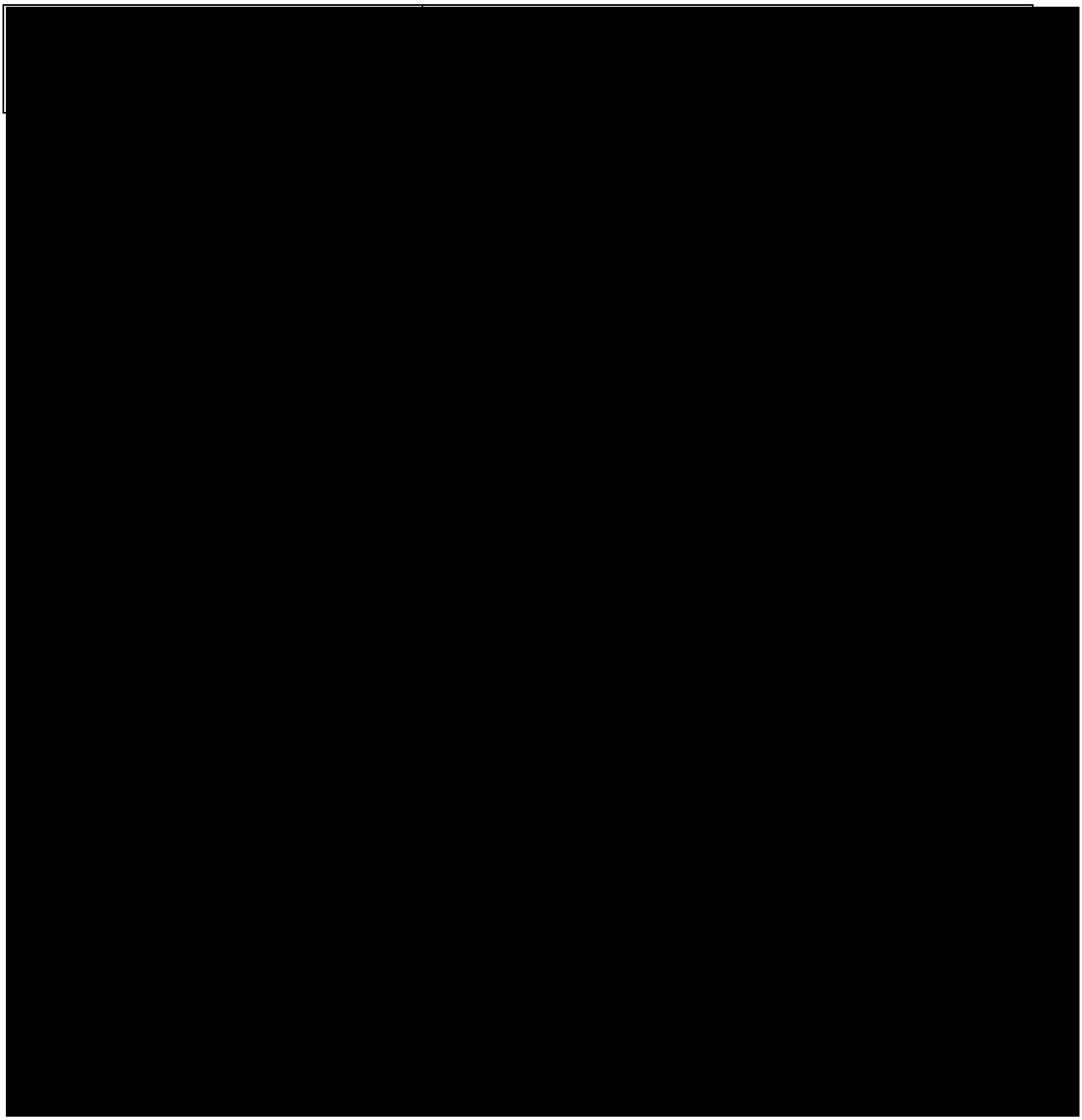
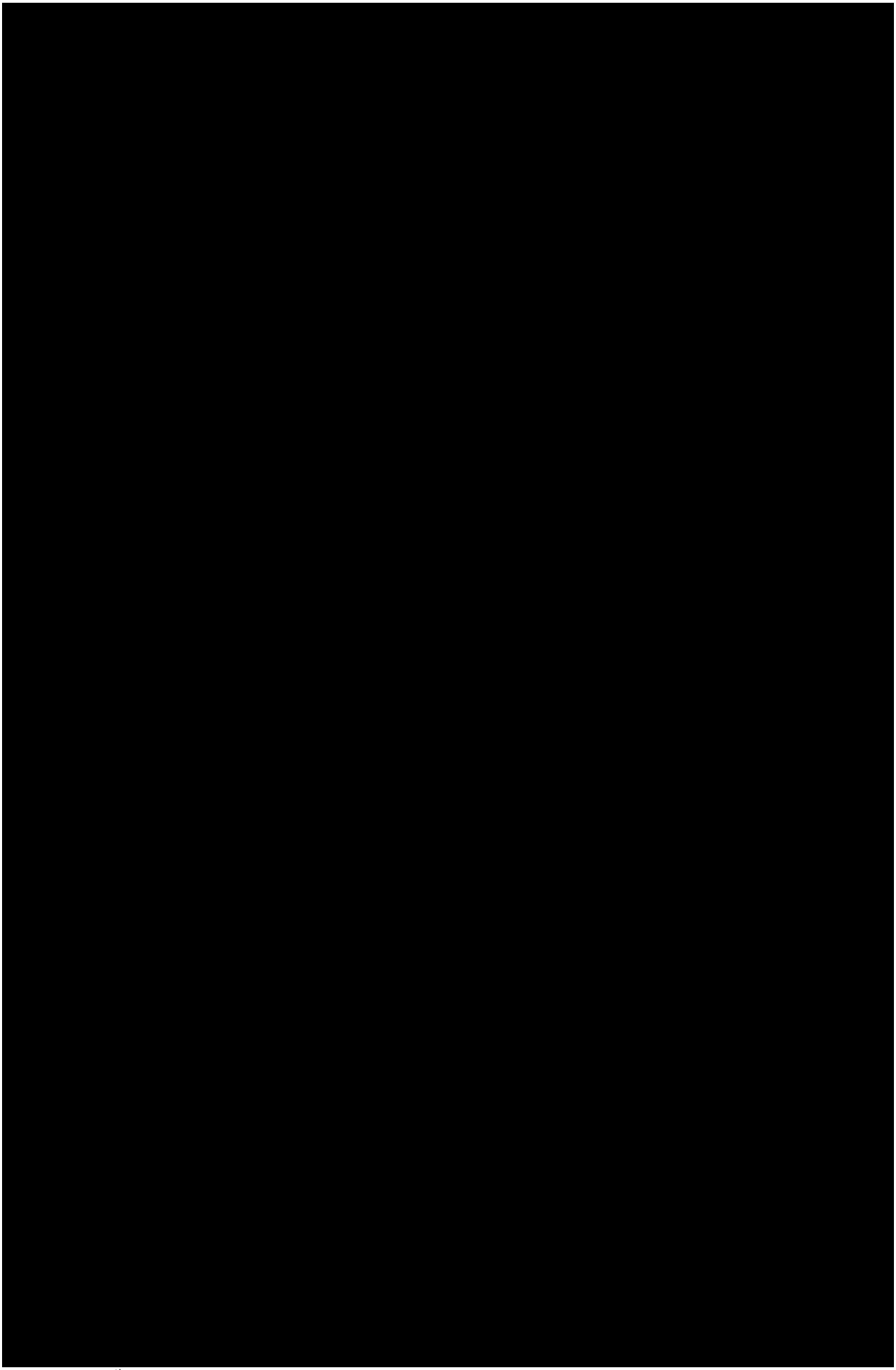
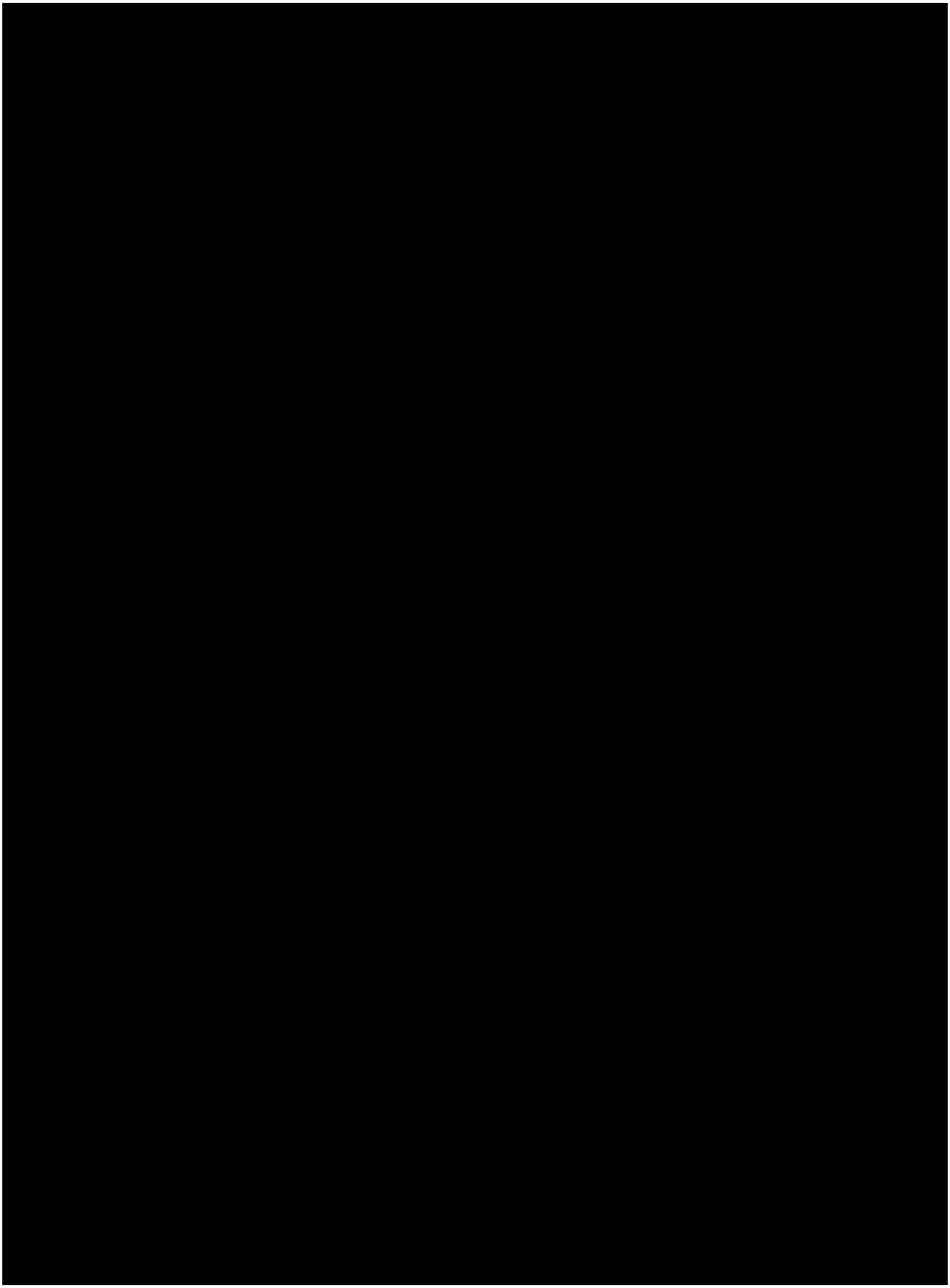
[redacted]







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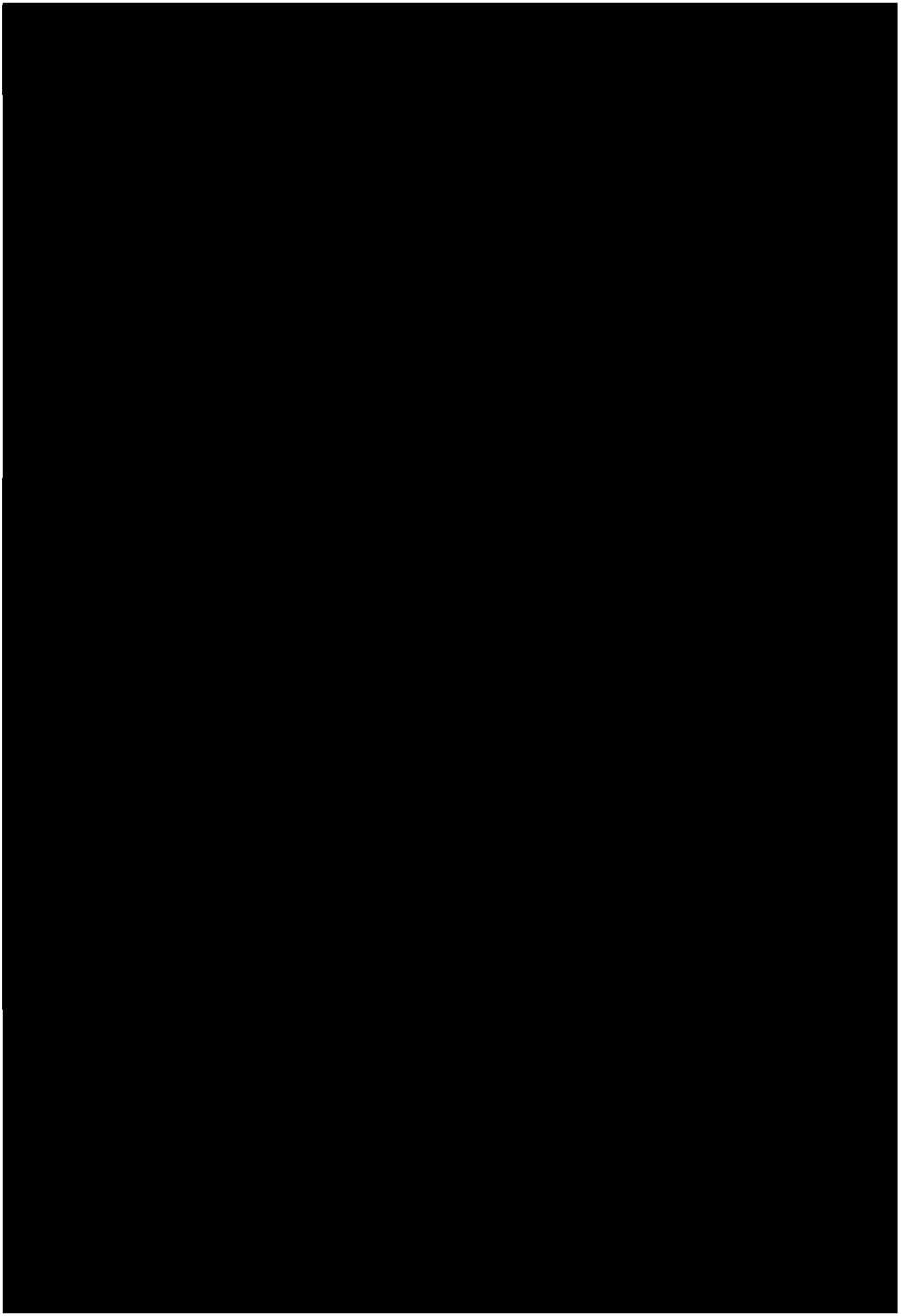

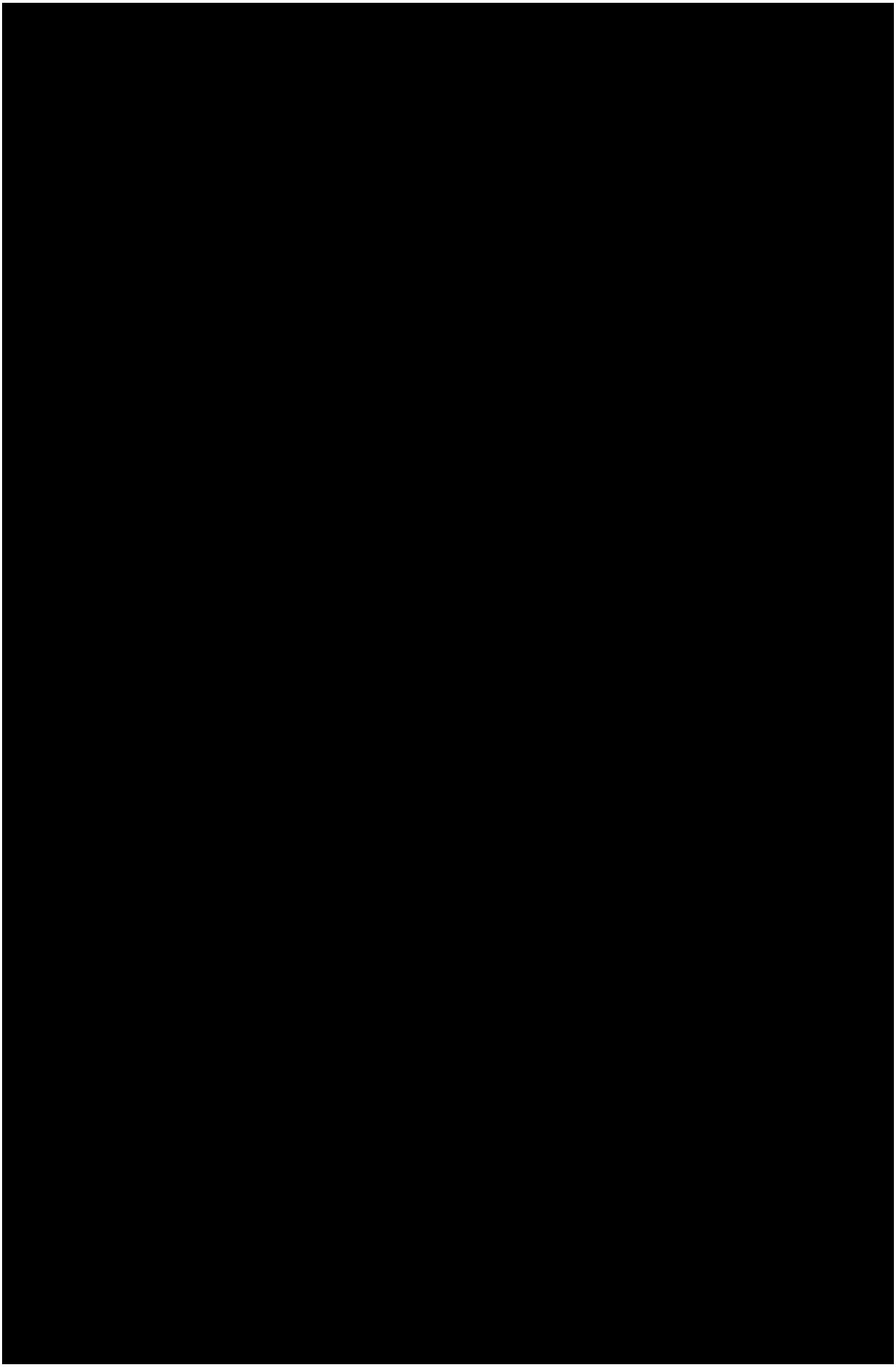

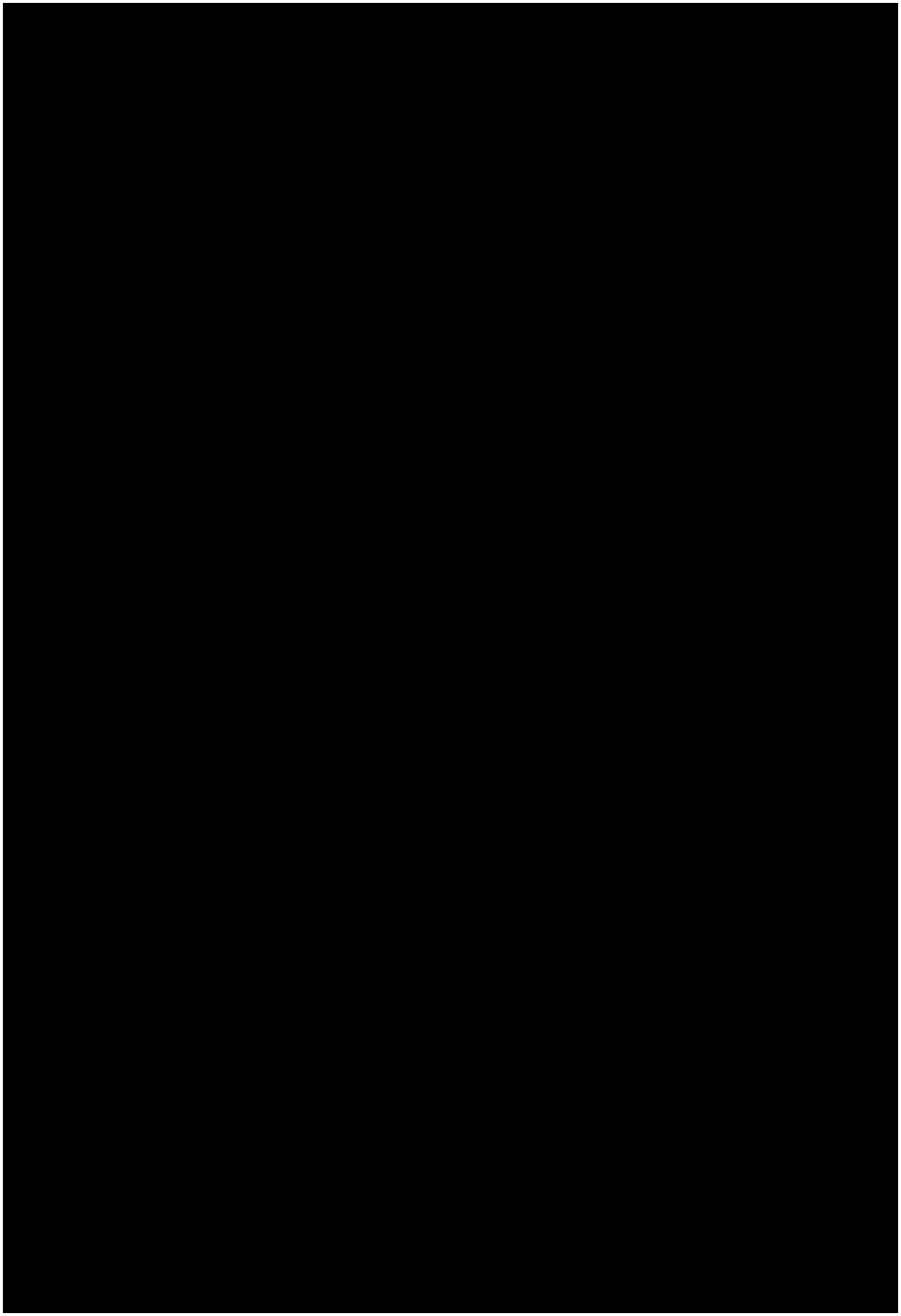

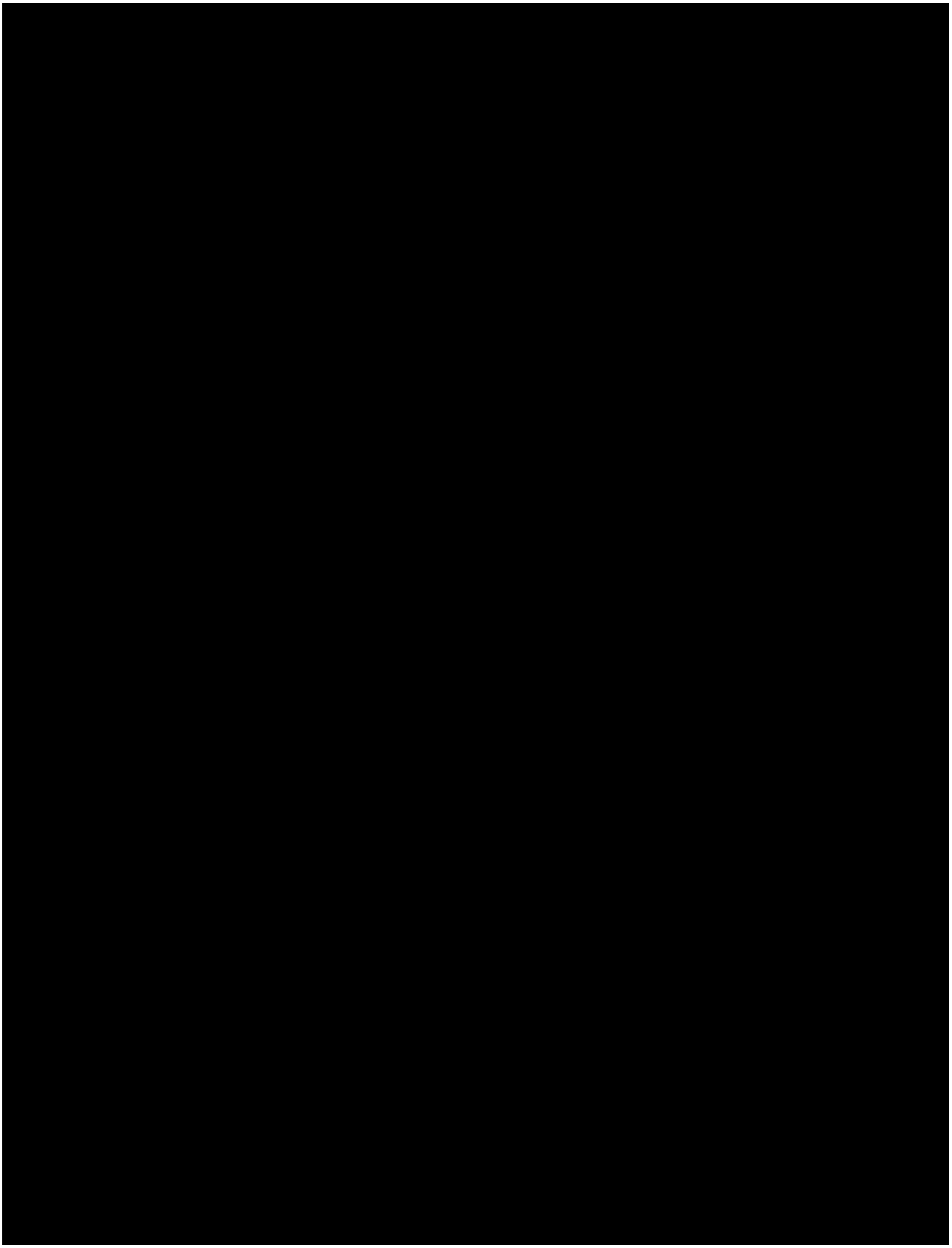

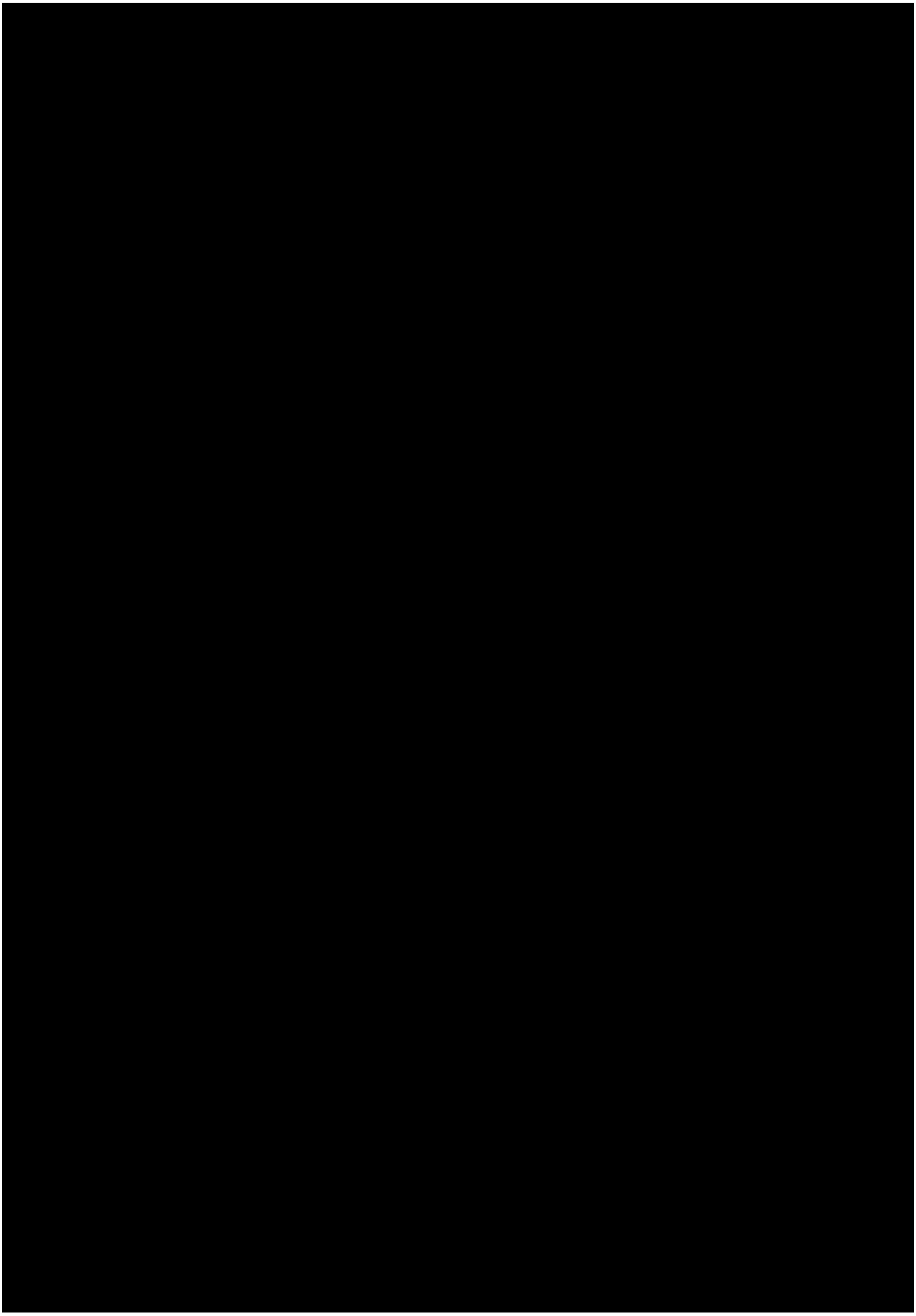

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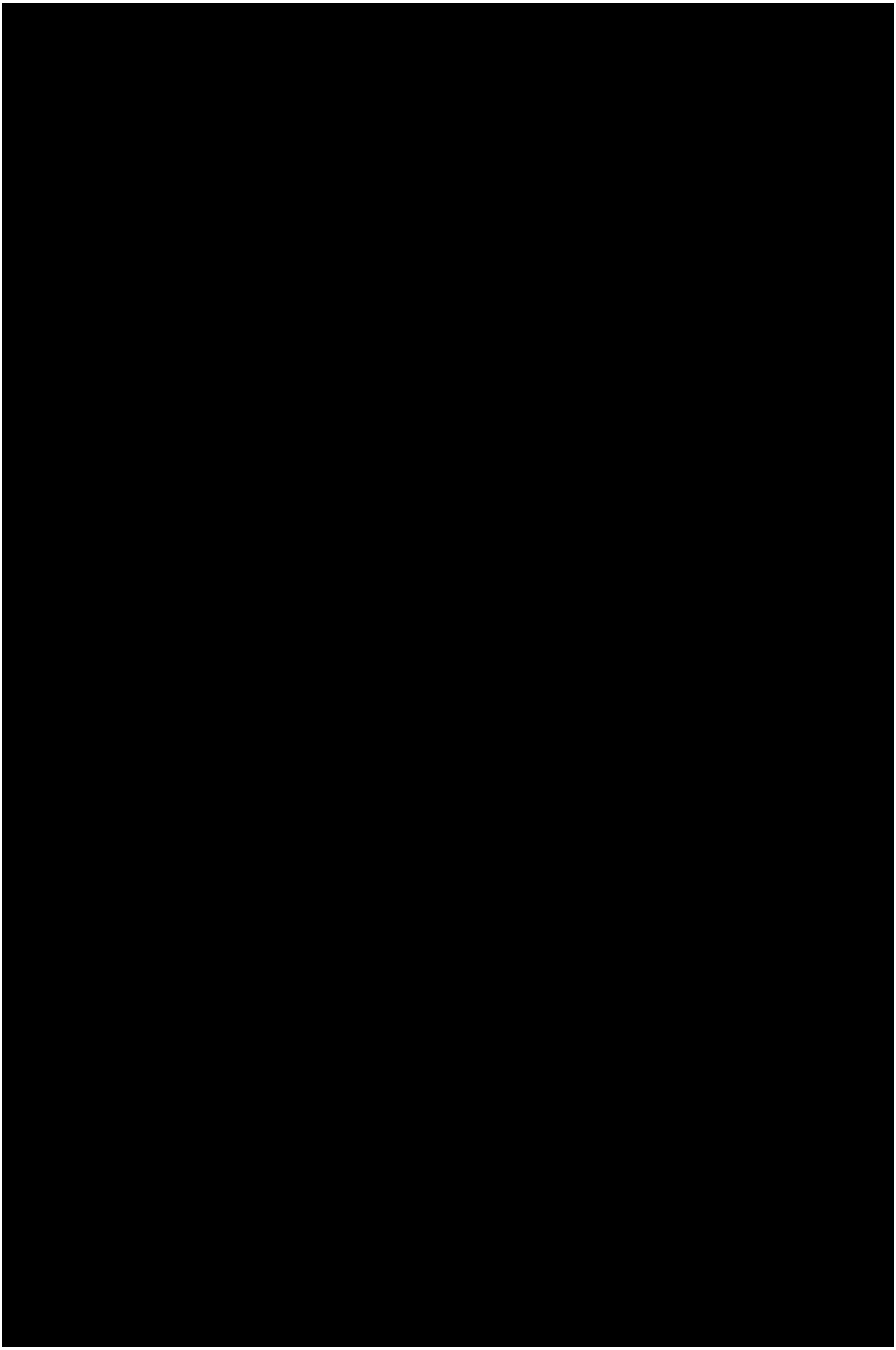

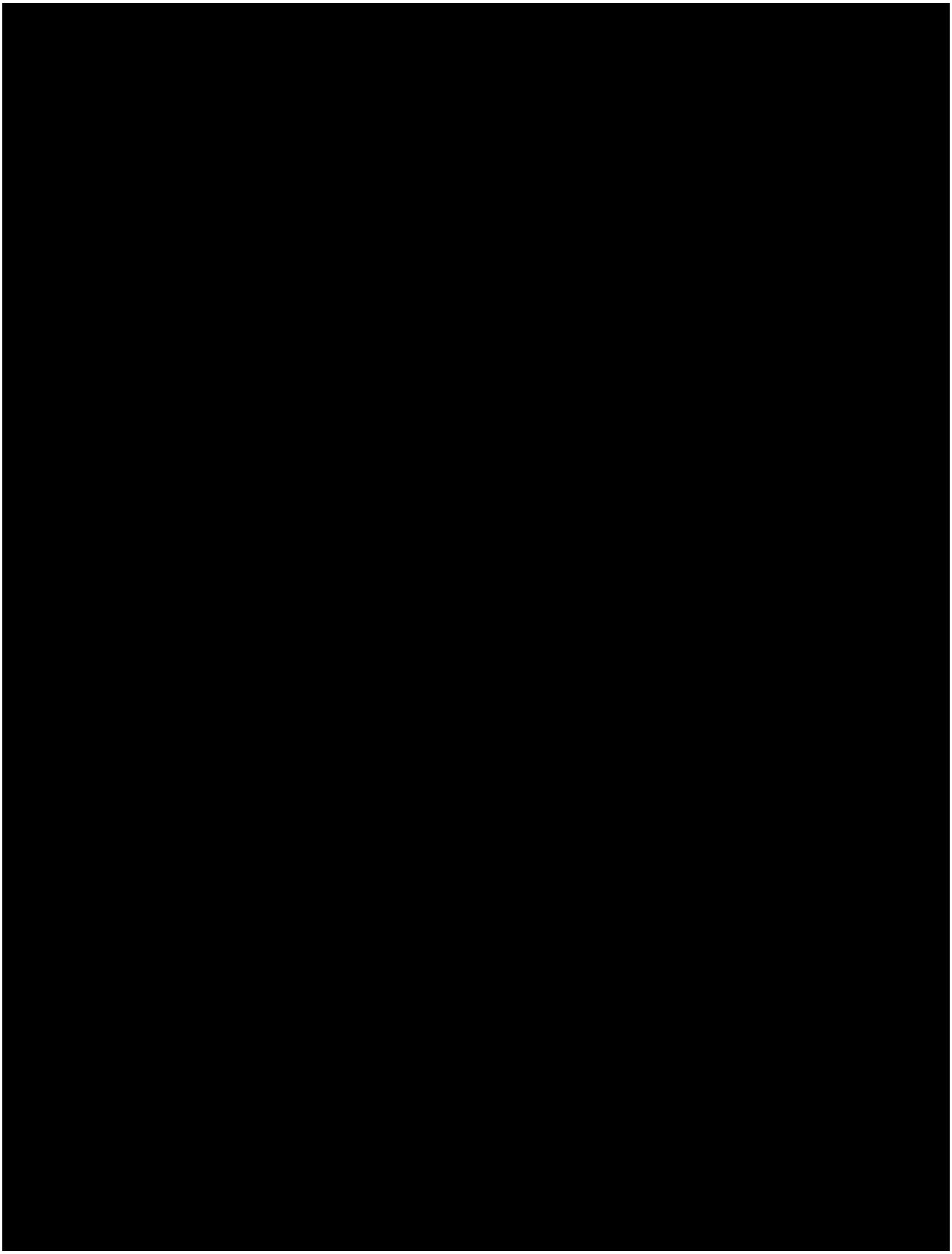

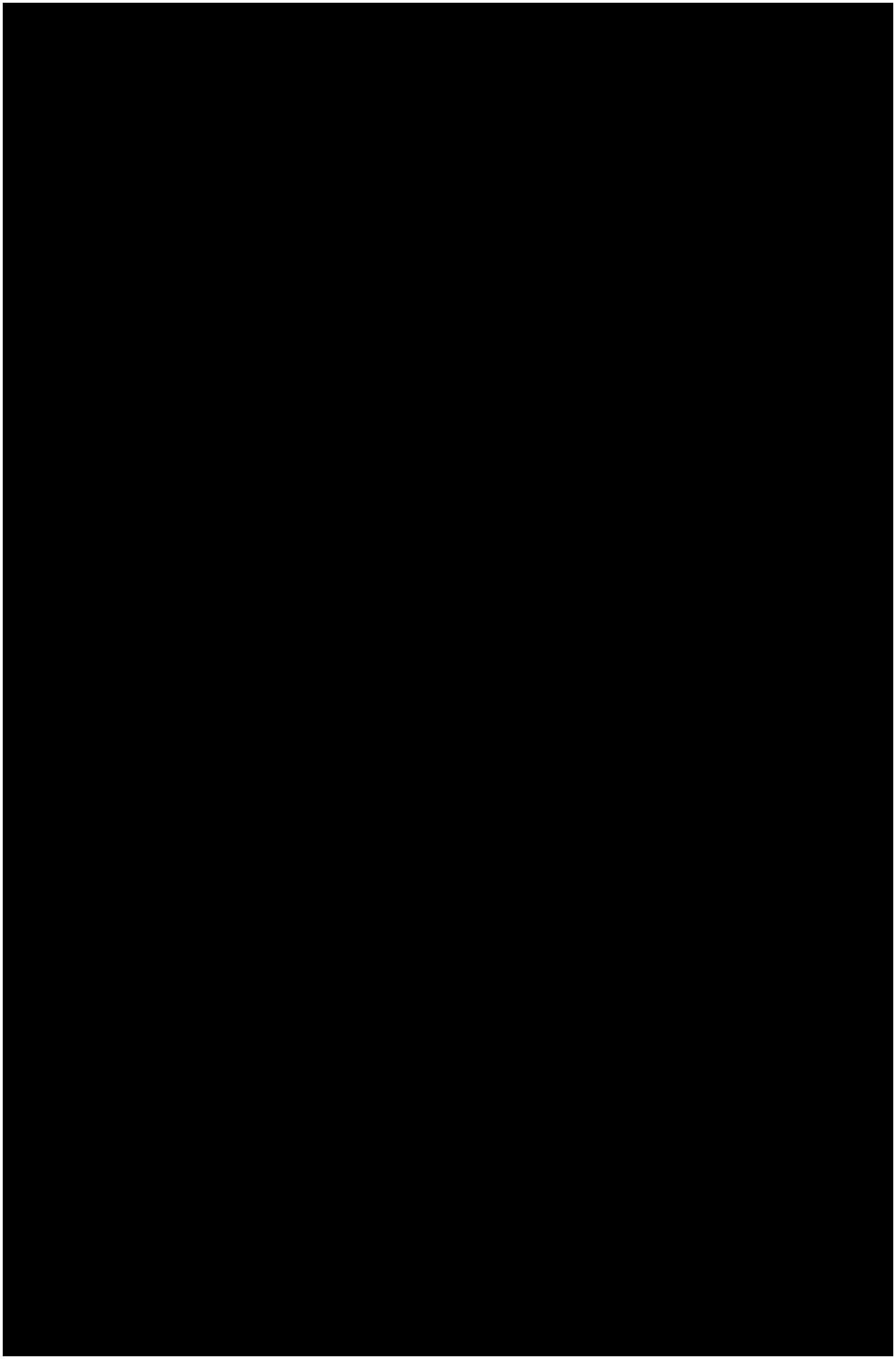

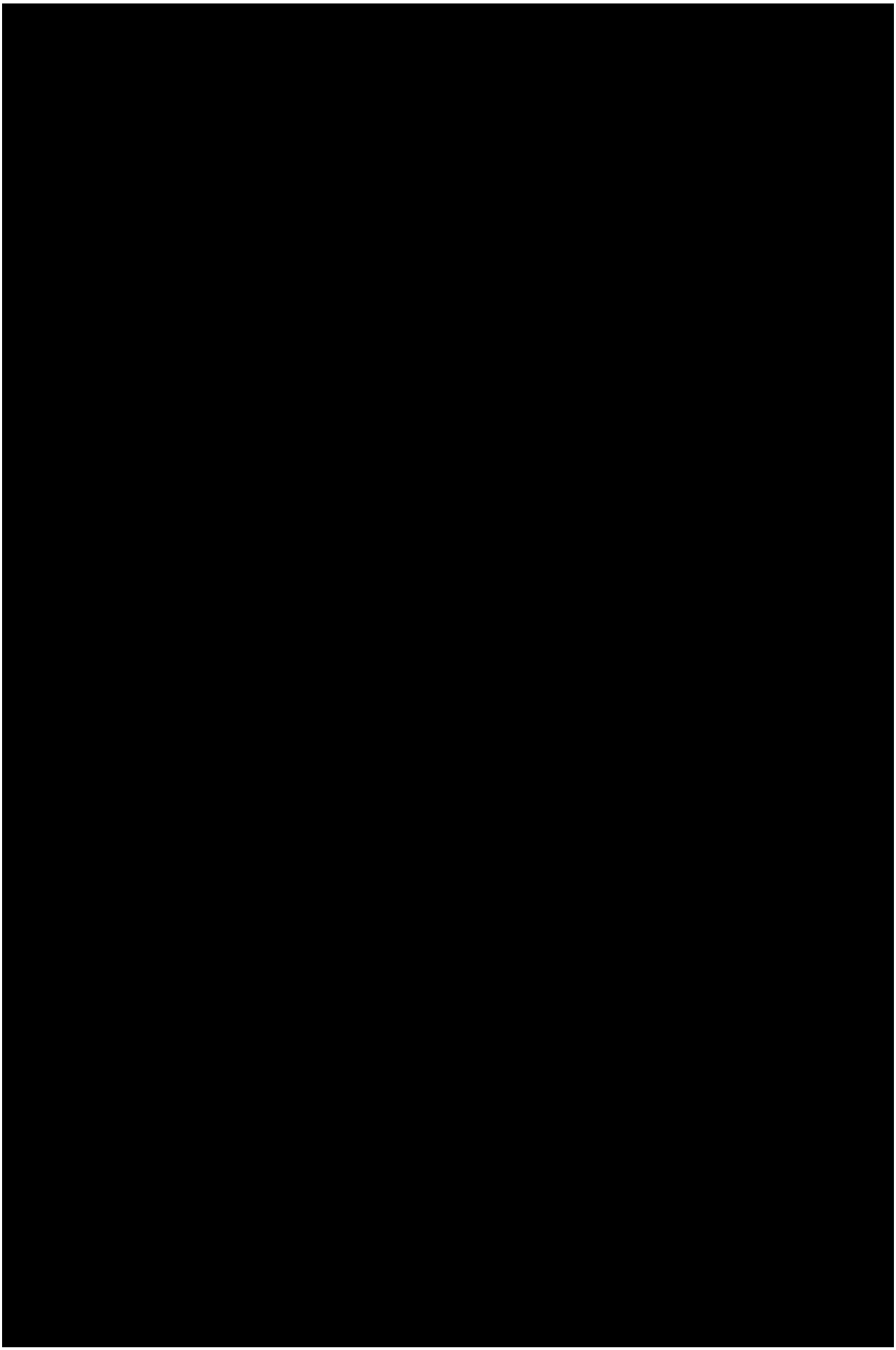

Section F [redacted] Exhibits Index

		Page(s)
1	WM01 RE_ 1796 Pitsford WTW Right Hand Storage Tank	1581 - 1585

From: WQ Risk and Optimisation
To: [redacted]
Subject: RE: 1796 Pitsford WTW Right Hand Storage Tank
Date: 30 September 2016 08:36:43
Attachments: image001.png
image002.png
image003.png

Hi [redacted]

Part A approved,

Regards,
[redacted]

From: [redacted] [mailto:[redacted]sweco.co.uk]
Sent: 29 September 2016 16:24
To: WQ Risk and Optimisation
Subject: RE: 1796 Pitsford WTW Right Hand Storage Tank

EXTERNAL MAIL

Hi [redacted]

I've updated Line 5 as mentioned.

Kind regards,

[redacted]
Senior Engineer

+44 [redacted]
+44 [redacted]
[redacted] sweco.co.uk

Sweco
1st Floor, Yorke House, Arleston Way, Shirley
Solihull
B90 4LH
+44 121 711 6600
www.sweco.co.uk
Connect with Sweco

From: WQ Risk and Optimisation [mailto:WQRiskandOptimisatio@anglianwater.co.uk]
Sent: 29 September 2016 13:48
To: [redacted] <[redacted]sweco.co.uk>
Subject: RE: 1796 Pitsford WTW Right Hand Storage Tank

Hi [redacted]

Line 5, pipes are always large surface areas, can you change this please, I can then approve Part A of MIC form.

Thank you,
[redacted]

From: [redacted] [mailto:[redacted]sweco.co.uk]
Sent: 29 September 2016 10:48
To: [redacted]
Cc: [redacted] Brooks
Subject: RE: 1796 Pitsford WTW Right Hand Storage Tank

EXTERNAL MAIL

Hi [redacted]

I've updated form 1796 on the G drive in line with [redacted] amendments.

[redacted]

Kind regards,

[redacted]
Senior Engineer

+44 [redacted]
+44 [redacted]
[redacted]sweco.co.uk

Sweco
1st Floor, Yorke House, Arleston Way, Shirley
Solihull
B90 4LH
+44 121 711 6600
www.sweco.co.uk
Connect with Sweco

From: [redacted] Brooks [mailto:[redacted]@stonbury.co.uk]
Sent: 29 September 2016 06:56
To: [redacted] <[redacted]sweco.co.uk>
Cc: [redacted] <[redacted]@stonbury.co.uk>; [redacted] <[redacted]anglianwater.co.uk>
Subject: RE: 1796 Pitsford WTW Right Hand Storage Tank

Morning

Please find attached the amended MIC form

Hi [redacted]

Line 5 is paint for the pipework, and there is only a very small amount in the tank (less then 5m2)

Line 3 and 4 is a 200mm wide strip of material that goes over the joints within in the tank itself. So while there is 115 liner metres in the tank it still only equates to 23m2 of material.

Cheers

[redacted]
Team Leader

tel [redacted]
mob [redacted]
www.stonbury.com

From: [redacted] [mailto:[redacted]sweco.co.uk]
Sent: 27 September 2016 11:13
To: [redacted]
Cc: [redacted]
Subject: FW: 1796 Pitsford WTW Right Hand Storage Tank

Hi [redacted]

Please see another query from the WQ Team below.

From: WQ Risk and Optimisation [mailto:WQRiskandOptimisatio@anglianwater.co.uk]
Sent: 27 September 2016 11:08
To: [redacted] <[redacted]sweco.co.uk>
Subject: FW: 1796 Pitsford WTW Right Hand Storage Tank

Hi [redacted]

MIC1796-Small surface area are usually approved by WRAS, KIWA or a BS6920 Test Certificate. Lines 3-5 have DWI approval should these be large surface areas?

Regards,
[redacted]

From: WQ Risk and Optimisation
Sent: 26 September 2016 10:41
To: [redacted]
Subject: RE: 1796 Pitsford WTW Right Hand Storage Tank

Hi [redacted]

MIC1796: The product names need to be fuller, can you update these please

Line1- Monolevel 844SP
Line 2- Flexcrete Cementitious Coating Grey or White?
Line 3- MasterSeal 930
Line 4- Master Seal 933
Line 5- Acothane DW Blue,

Regards,
[redacted]

From: [redacted] [mailto:[redacted]sweco.co.uk]
Sent: 21 September 2016 14:20
To: WQ Risk and Optimisation
Subject: 1796 Pitsford WTW Right Hand Storage Tank

EXTERNAL MAIL

Hi,

Please could you review 1796 MIC Part A. These are materials which have been used for the refurbishment of the Right Hand storage tank (tank no. 2) at Pitsford WTWs.

The storage tank is due to be filled and put back into service shortly.

[redacted]

Kind regards,

[redacted]
Senior Engineer

+44 [redacted]
+44 [redacted]
[redacted]sweco.co.uk

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