Attachment 9: Additional Winter Readiness Considerations

When conditions exist that may lead to heavy rains, increased river, lake or water way levels appropriate measures shall be taken to ensure asset protection and minimal risk to the plant. These shall include but are not limited to the following

- Increase operator attention for areas that are subject to water intrusion as a result of high water levels.
- Ensuring floating debris does not enter plant systems.
- Oil separators and other retention ponds do not contaminate surrounding areas.
- Provisions are made to dam or elevate equipment or components that are staged in areas that are susceptible to flooding (e.g., availability of sand bags, portable pumps, and sump pumps, etc.).
- Appropriate actions are taken to prohibit walking or vehicle traffic in areas that have flooded and could place employees in harm's way.
- Plant facility backlogs shall be reviewed for deficiencies that could introduce water into the facility, such as roof leaks, poor sealing windows or doors, electrical or mechanical penetrations that are known to provide a pathway for water intrusion.
- Water that does enter the Plant is to be evaluated for increased risk to personal safety, production, and environmental. impact.

When conditions exist that may lead to high winds or other extreme storm related conditions the following actions shall be initiated.

- The Plant personnel shall walk down the property to identify materials or debris that could become airborne during high wind conditions. Action shall be taken to secure or remove the hazards to ensure that equipment or personnel are not injured during the condition.
- Increase operator attention during the high wind or storm conditions to identify new hazards. Operators shall not put their own safety at risk.
- Plant facility backlogs shall be reviewed for deficiencies that could become airborne during high wind conditions such as building siding, roofing material, or protective covering

Attachment 10: Personnel/Operator Training

Training Rosters and Training Materialsshould be retained by Plant for 5 years.

Employee Name	Date Training Complete	Employee Signature	Comments

Attachment 11: Winter Readiness Action Timeline

Key Milestone	Recommended Completion	Comments
Initial Annual Pre-Winter Readiness Meeting	May–July	Meeting to review: Plant Winter Readiness Plan, Open Corrective "Winter" Work Orders and PMs
Final Workscope and Actions Required	August–September	Finalized workscope approved by Plant Manager to implement prior to winter
Operations Procedures Reviewed and Updated as Required	October	Site specific Winter Operations Procedures reviewed and updated based on lessons learned and new equipment added
Winter Readiness Training	November	Complete training for plant personnel involved with Winter Preparedness and Winter Operations
Winter Readiness Certification by the Plant Manager	November	Provided to RVP. Reference Attachment 17
Winter Readiness Activities Completed	December 1	This date may vary for specific plants based on location
Post – Winter Meeting	March–April	Review specific plant lessons learned from the past winter.

Attachment 12: Bosque Winter Readiness Certification

To: (Regional VP, Operations Name)

From: (Plant/General Manager Name)

Subject: Winter Readiness Certification

(Plant Name) has reviewed the requirements of the Plant Specific Plans and Procedures related to Winter Readiness preparation and Winter Operation, and by copy of this letter is ready to certify (Plant Name) winter readiness. [Plant] has completed review of plant winter readiness and implemented preventive and corrective actions required to provide reasonable assurance of operation during foreseeable winter conditions at the site. In-progress items relating to winter operation are summarized below.

A. The basis for our certification is as follows:

1. Significant outcomes of system reviews
2. Status of preventive maintenance affecting Winter Readiness
3. Status of corrective maintenance affecting Winter Readiness
6. Status of modifications/projects affecting Winter Readiness
7. Status of Operations Winter Readiness Procedures/Checklists
8. Status of Winter Readiness supplies
9. Other

B. Winter readiness items not completed

1. Reason
2. Open Actions Items
3. Owner & Due Date

BOP 046 COLD WEATHER OPERATING PROCEDURE

All documents can be found in the following folder P:\Public\BOSQUE PROCEDURES\COLD WEATHER OPERATIONS

- **Ambient Air Temperature [redacted] and Falling.**
  - When ambient air temperatures are expected to be [redacted] and falling we need to make that all temporary enclosures have heaters that are full of fuel if applicable and plugged in and functional, building doors are closed and all heat trace panels are in auto. The temporary enclosure map can be found by clicking this link FREEZE PROTECTION TEMP SHELTERS 1-A.
- **Ambient Air Temperature at or below [redacted]**
  - When plant ambient temperature (DCS tag Plant_Temp) is [redacted] the Calpine Bosque Freeze Protection Beginning Shift Inspection should begin. The inspections should be completed at the beginning of each shift during freezing conditions.
  - When plant ambient temperature (DCS tag Plant_Temp) is [redacted] the Calpine Bosque Instrument Box Freeze Round should begin. Follow the directions below for Instrument Box Inpection: Heat Trace panels are operational and working. Verify ALL strip heaters, space and lamps operational during freezing events. Transmitter Enclosure temp above [redacted] per thermometer. Mark with check mark if [redacted] and write in the temperature if below. If ambient temperatures are between [redacted] complete round every 4 hours for boxes that are greater than [redacted], recheck the boxes that are [redacted] every 2 hours. If ambient tempeatures are below [redacted] complete round every 2 hours. If instrument boxes or are indicating at or below freezing place temporary freeze protection (bulbs or heaters) and write a work order so they can be repaired.
  - When plant ambient temperature (DCS tag Plant_Temp) is at or below [redacted] begin monitoring the cooling towers for icing, follow procedure BOP 010 Cooling Tower Winter Procedures for de-icing instructions.
- **Ambient Air Temperature [redacted]**
  - When plant ambient temperature (DCS tag Plant_Temp) [redacted] the Calpine Bosque Instrument Box Freeze Round should be done every 2 hours.
- **Ambient Air Temperature [redacted]**
  - When plant ambient temperature (DCS tag Plant_Temp) is [redacted] turn on the Freeze Prevention Logic for both power blocks as well as enable the Clarifier continuous run. At this time the freeze watch screens on both power blocks need to be monitored at all times. The procedure for the freeze prevention as well as the clarifier continuous run can be found by clicking this link BOP 052 FREEZE PREVENTION LOGIC PROCEDURE.

CALPINE®
NYSE CPN

Channel Energy Center Procedure Manual

DOCUMENT: PLANT SPECIFIC WINTER READINESS PLAN

REVISION: 1

DocuSigned by: Ed Simcik MA
PLANT MANAGER

11-22-2021
DATE

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1.0 PURPOSE

The purpose of this document is to describe the process to be used for preparing the Plant for reliable operations during the Winter Period by ensuring compliance with the Plant Specific Winter Readiness Plan (the "Plan"). The Plan is to be used in conjunction with the Winter Readiness Standard (the "Standard"), Plant Specific Winter Operations Procedure (the "Procedure"), the Winter Readiness Actions Timeline, checklists, worksheets, and Maximo PMs.

2.0 SCOPE

For the purpose of this procedure, the Winter Period is from November 1 through March 15. This Plan directs the management of the scope of work activities for staff to complete before cold weather arrives. This Winter Readiness Plan is not the same as the Procedure. The Plan is to provide guidance for *preparing* the plant to endure winter temperatures without unplanned or forced outages or derates. The Plant staff will implement the Procedure only when the ambient temperature is low enough to cause potential problems. The intent of the Plan is to identify reliability issues that are directly related to cold weather, not reliability issues in general.

3.0 DEFINITIONS

Critical Equipment: Plant equipment that, during cold weather events, has the potential to: initiate a unit trip, impact unit startup, initiate an automatic runback, adversely affect environmental controls that may cause an outage or derate, adversely affect the delivery of fuel or water supply to the unit, or create a safety hazard.

Winter Period: The period from November 1 through March 15.

4.0 RESPONSIBILITIES

Plant Manager

The Plant Manager is responsible for those items contained in the Procedure.

Maintenance Manager

The Maintenance Manager is responsible for those items contained in the Procedure.

Operations Manager

The Operations Manager is responsible for those items contained in the Procedure.

Business Manager

The Business Manager is responsible for those items contained in the Procedure.

Winter Readiness Coordinator

A Winter Readiness Coordinator shall be appointed by the Plant Manager and is responsible for those items contained in the Procedure.

5.0 THE PLAN

In accordance with the Standard, the Plant has developed a Plan which includes its performance and documentation of the following activities, whenever applicable:

The Plant reviews any Plant modifications made in the previous year to verify that the modifications have not impacted the minimum plant design operating temperature.

This annual review is scheduled on PM #101891 and the results are documented in the Plant's SharePoint or Maximo.

2. Review of Lessons Learned. The Plant reviews equipment freezing issues experienced over the previous year to determine lessons learned and incorporates lessons learned into the Plant Plan to avoid any reoccurrence.

   This review is scheduled in PM #101887 and any identified action items are placed in Maximo work orders and identified with program code "Season" and Task Code "Winter" and reviewed during annual training with Plant staff. Any lessons learned may also be documented in the Plant's SharePoint.

3. Review Critical Equipment List. A list of Plant Critical Equipment that may be impacted by cold weather. Relevant attachments are contained in Procedure.

4. Inspection and Testing of Heat Trace Panels and Heat Tracing for Critical Equipment Instruments. The type of heat tracing used at the Plant is the constant wattage type. Heat tracing is used to protect instruments and other vulnerable equipment from freezing.

PM #101897 is in Maximo for monthly testing. Any issues found during these PM checks are documented as follow up work orders in Maximo and identified with program code "Season" and Task Code "Winter." Relevant attachments are contained in Procedure.

5. Perform Instrument Air System Maintenance. The Instrument Air System is critical to the operation of the Plant. Instrument Air System components are given high priority when malfunctions occur. To maintain the system integrity, moisture is removed from the system by automatic blowdown of the system

   The design dewpoint is -40°F and the dewpoint is monitored by Operations personnel and an annual walk down of the system is performed as part of the Procedure. An annual review of the Instrument Air system maintenance is performed on PM #11920 prior to winter.

6. Review Corrective Maintenance Work Orders. As part of the Winter Period preparation, a review of open Corrective Maintenance Work Orders having program code "Seasonal", and Task Code "Winter" is conducted to determine their potential impact on winter readiness and shall be integrated into the Plant's work week.

   The review is documented as part of the Plan on PM #110171.

7. Perform Plant Insulation Walkdown. Perform a Plant walk down of the Critical Equipment's insulation and lagging and identify areas of insulation that should be considered for repair prior to winter operation. PM #117510 is in place to generate a work order for this review.

8. Winter Readiness Consumables and Supplies. An inventory check is performed on by Operations personnel (PM #117411) as part of the Procedure prior to the Winter Period. A list of consumables and supplies kept in store for freeze protection is attached to the Procedure.

9. Test Portable Heaters and Heat Lamps. Portable space heaters used for freeze protection are kept in a designated storage area for winter supplies. An operational test is performed on these portable heaters annually by Operations personnel (PM #110110) as part of the Plan prior to the Winter Period.

10. Test Permanent Building Space Heaters. An annual operational/functional check of all space heaters permanently installed in Plant buildings is conducted annually to ensure proper operations under PM #116224. A copy of the list of permanent building space heaters and their location is attached to the Procedure.

11. Check Glycol Concentration. Not applicable. The Plant does not have any closed loop systems.

12. Space Heaters on Critical Instrument Breakers. Not applicable. The Plant does not have

space heaters on critical equipment breakers.

13. Operation Check of Instruments with Instrument Box Heaters. Insulation boxes on critical instruments are contained in the relevant attachments contained in the Procedure.

14. Installation and Disassembly of Temporary Wind Breaks / Enclosures. Windbreaks and temporary heaters are installed annually to protect critical equipment from freezing. PM #116221 is performed each year to erect wind breaks/enclosures. Temporary windbreak locations around the Plant is contained in the Procedure.

15. Draining Equipment. PM #100189 is conducted to drain equipment prior to winter.

16. Fuel Oil Handling Equipment. Not applicable. The Plant does not have any fuel oil handling equipment.

17. Icing Prevention Equipment. Not applicable. The Plant does not have any icing prevention equipment.

18. Additional Preparations for Susceptible Plants. Not applicable. The Plant is not located in a winter storm susceptible area.

19. Annual Plan Review. This Plan will be reviewed annually by Plant management. PM#101891 is in place to ensure the annual reviews are performed.

20. Personnel/Operator Training. Winter readiness refresher training is completed annually as part of the Plant's Procedure prior to the Winter Period. The training will include any applicable Plant modifications, past winter lesson's learned, alternative instrumentation should the Plant's primary instrumentation becomes unreliable.

    Personnel and Operator Training is documented as part of the Plan on PM #117508 and attendance by Plant personnel is documented.

21. Winter Readiness Action Timeline. Complete the Winter Readiness Action Timeline of this Plan contains a timeline for winter readiness actions and milestones.

6.0 The Procedure

In accordance with the Standard, the Plant implements the Procedure when outside ambient air temperature at the Plant decreases or decreases to the amount specified in the Procedure, including completing the Freezing Weather Actions and Logsheets.

7.0 Pre-Winter Plant Status Reviews and Readiness Certification

Prior to the onset of the Winter Period each Plant Manager verifies winter readiness and formally communicates site status to the RVP see example contained in the Procedure.

8.0 REFERENCES

- CSN-1021 (Winter Readiness Standard)
- CPN-714 (Records Management)
- CSN-101 (WORK MANAGEMENT PROGRAM)
- Management OF Design Change Procedure

Channel Energy Center

Seasonal Readiness Procedure – Winter

Prepared by	Ed Simcik – Plant Manager	11/22/2021 Date
Reviewed by	Audencio Guajardo - Interim Operations Manager	11/22/2021 Date
Reviewed by	Josh La Clair- Interim Maintenance Manager	11/22/2021 Date
Approved	Ed Simcik – Plant Manager	11/22/2021 Date

Rev	Date	Prepared By	Approval
5	11/22/2021	Marlon Griffin	Ed Simcik

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Winter Readiness Procedure

1.0 PURPOSE AND SCOPE

Provide instructions for protecting equipment during extreme cold weather season (November 1st to March April 1st of the following year) when outside air temperature is predicted to decrease or decreases to **ANY** of the following conditions:

[redacted]

Provide instructions for Restoration from Freezing Weather

2.0 DEFINITIONS

Seasonal – Geographical areas in the Calpine Fleet may be susceptible to localized flooding, heavy rains, high winds, blizzards, and other storm related conditions. For those areas additional preparations beyond those defined in the winter periods may be required.

Efforts are to focus on completing preparatory activities two (2) weeks prior to the start of the period.

SEVERE WEATHER CONDITION 1:

- Outside air temperature decreases to, **OR** is predicted to decrease to, [redacted]

SEVERE WEATHER CONDITION 2:

- Outside air temperature decreases to, **OR** is predicted to decrease to, [redacted]

OR

- ERCOT ISO has issued Emergency Preparation Step C (Cold Weather Alert)

SEVERE WEATHER CONDITION 3:

- Outside air temperature decreases to, **OR** is predicted to decrease to, [redacted]

OR

- ERCOT ISO issues Emergency Preparation Step D (Severe Cold Weather Alert).

3.0 EQUIPMENT

The Procedure is designed around the following ambient temperatures:

[redacted]

[redacted]

The instrument air system is operated at a -40 degree dew point temperature.

The instrument air system is blown down automatically at the air compressor or during extreme cold conditions; low points identified on **Attachment 09** are blown down manually as needed.

4.0 RESPONSIBILITIES

Plant Manager

The Plant Manager is responsible for:

- Providing a delegate to be the Winter Readiness Coordinator.
- Provide updates as required to the Regional Vice President, Operations.
- Overall Plant preparations and for certifying to the respective Regional Vice President, Operations that the Plant is ready for winter operation.
- The readiness effort of the Plant by participating in conference calls/meetings as needed with the Regional Vice President, Operations to ensure necessary actions are completed in a timely manner during severe weather events.
- Approving site-specific Pre-Winter/Winter Readiness activities and checklist, and assuring all winter readiness work that is identified is completed prior to the required winter completion date for all such work.
- Assure all site-specific Winter Readiness activities that are Plant and identified corrective work, are Maximo PMs or corrective work orders. All winter readiness Procedures and repair work is required to be documented in Maximo (using the category "Seasonal" and the task category "Winter").
- During cold weather operations, assure the site specific Winter Operation Checklists are being implemented and any issues identified and corrected in a timely manner to assure continued reliable winter operation.
- Deciding that emergency actions are necessary to prevent equipment damage OR lost power production during any declared severe weather condition (cold).
- SHALL implement this process prior to or upon a National Weather Service or company meteorologist prediction of falling temperatures within any of the limits described in Section 3.

Maintenance Manager

The Maintenance Manager is responsible for:

- Implementing the Winter Readiness Procedure and revising the Procedure as required based on lessons learned.
- Assure the Winter Readiness PMs and other activities are in Maximo PMs and implemented in accordance with the timeline included in the Plant's Winter Readiness Procedure and documented in Maximo (using the category "Seasonal" and the task category "Winter").
- Screening emergent work for winter readiness applicability.
- Ensure that equipment deficiencies identified (that could impact Plant reliability) are addressed and corrected in a timely manner, with all repairs properly documented in Maximo.
- Conducting Pre-Winter system preparation walk downs per Maintenance Manager Pre-Winter Walkdown.
- Ensuring that Winter Readiness PMs are activated and scheduled.

Operations Manager

The Operations Manager is responsible for:

- Implementing the Winter Readiness Procedure and revising the Procedure as required based on lessons learned.
- Review the Procedure prior to winter to ensure the site operating procedures, checklist and instructions are current and include any new equipment that may have been added to the Plant configuration since last winter.
- Review the on-going activities that are implemented during the winter including checklists as identified in the Procedure.
- Verify that communication systems are operational and backup communications are in place.
- Deciding which Cold Weather Checklists are necessary based on weather conditions.

Business Manager

The Business Manager is responsible for:

- Initial stocking of any consumables and supplies that are required to be on hand prior to the winter seasonal period.
- Re-ordering any consumables and supplies that may have been used during weather events to assure continued supply for the entire winter season.

Winter Readiness Coordinator

The Winter Readiness Coordinator is the Plant Engineer, and is responsible for:

- Assuring completion of actions needed to achieve sustained reliability and availability by readying the Plant for possible extreme weather events and other seasonal related conditions, and for notifying Plant management for action when required readiness actions are not being completed as scheduled.
- To provide oversight of the Plants progress toward winter readiness.
- Chairing the Plant winter readiness meetings.
- Developing and monitoring action Procedures.
- Monitoring scheduled maintenance for completion and follow up on winter readiness issues.

5.0 PROCESS

A Winter Readiness Coordinator shall be appointed by the Plant Manager. The Winter Readiness Coordinator shall direct and coordinate the efforts of contributing departments. The Winter Readiness Coordinator shall monitor work preparation and completion and report progress on a regular basis to the Plant Manager.

Winter readiness is accomplished through the identification of required work which includes

- post season critique,
- engineering reviews and scope recommendation;
- scope approval; incorporating seasonal work into schedule,
- completion of work activities that are on schedule and on seasonal readiness checklists and
- acquiring appropriate seasonal readiness certification.

Specific checklists for the winter season are contained in the attachments.

5.1 POST SEASON CRITIQUE

A post season critique is conducted at or near the end of each winter season by the Plant Manager. The lessons learned from the past season are incorporated into best practices for improvement in future winter readiness.

5.2 ENGINEERING REVIEWS AND SCOPE RECOMMENDATION

A Plant's designee shall perform a review/walk down of systems to confirm requirements for winter readiness for each system using the Pre-Winter System Readiness Review Worksheet. The lessons learned from the past are incorporated into future winter seasons. Cross functional meetings should be held to obtain input from Operations, Maintenance and other stakeholders. Work activities that have to be completed each year to support winter readiness shall be set up as preventive maintenance repetitive tasks in Maximo.

5.3 SCOPE APPROVAL

The Plant Manager is the approval authority for winter readiness program scope. The initial scope of work as well as proposed changes to scope shall be approved by the Plant Manager.

5.4 WORK WEEK MANAGEMENT SCHEDULE

Winter readiness work orders shall be integrated within the Plant's work week schedule as per CSN-101 (Work Management Program). Scheduled completion dates should allow for all work to be completed on or before **November 1**, for Winter Readiness Items.

5.5 EXECUTING WINTER READINESS WORK ORDERS

Work identified and scheduled as seasonal readiness shall be executed in a timely manner.

5.6 COMPLETION OF PRE-WINTER SYSTEM READINESS CHECK SHEET

The Winter Readiness Coordinator shall prepare an action item matrix that details the actions required to prepare for winter operation, the owner of each action, and due date for each action. The lists of actions for winter are listed in the Pre-Winter System Readiness Check Sheet.

5.7 COMPLETION OF EXTREME WEATHER SYSTEM READINESS CHECK SHEETS

5.8 WINTER READINESS CERTIFICATION

The Plant Manager shall review the scope of work completed and work not completed, to justify that the Plant is prepared for seasonal operation. Guidelines for the letter are included in **Attachment 2** (Typical Winter Readiness Certification Letter).

5.9 INSTRUCTIONS

1. Temperature indication for determining the outside air temperature to decide when to enter this procedure or change to a different condition SHALL be used in following order:
   - Plant ambient air temperature taken from the weather station located on the DCS.
   - Houston National Weather Service
2. Use **Attachment 1** (Winter Readiness Action Timeline) as a guide for winter readiness actions. This time line may be modified or supplemented as required based on specific needs.
3. Initiate winter readiness actions starting **September 1**, by initiating selected system reviews as determined by Plant management and by reviewing open deficiencies that must be resolved prior to **November 1**.
4. Use Pre-Winter System Readiness Worksheet to document the reviews of systems selected.
5. Begin final readiness actions in the Fall as soon as normal daily high temperatures fall below

[redacted], or as soon as directed by Plant management based on the needs of the Plant.

6. Use Plant specific Pre-Winter checklists and/or procedures that describe the detail actions needed to prepare the Plant for winter operation.

7. Plant-specific documents used for winter readiness should specify all actions needed to ensure Plant buildings are properly heated and that equipment is protected from freezing conditions. These are contained in the Cold Weather Condition Checklists and the Pre-Winter Checklists.

8. When possible, use Plant work management systems to create recurring tasks that are required every year.

9. The Seasonal Readiness Coordinator should track completion of winter required activities on a regular basis and report issues to the Plant management team for resolution.

10. The Plant Manager shall provide winter readiness weekly updates as specified during the weekly Plant manager conference call on or before **October 1** and ending when all necessary actions have been completed.

11. Complete all actions required to ready the Plant for the winter season on or before **November 1**. Depending on Plant needs, additional preventive and contingent actions should be developed for extreme cold temperature conditions as well.

12. The Plant Manager is to certify the Plant's winter readiness via letter on or before **November 20**. Refer to the requirements of the certification in the typical letter on **Attachment 2** (Typical Seasonal Readiness Certification Letter) of this procedure.

13. Screen new equipment deficiencies for potential winter readiness impact and prioritize their resolution as required to ensure reliable winter operation. Work that is identified as a winter readiness related item shall be noted as such in Maximo.

14. Monitor Plant operations during the winter period to identify weaknesses in the winter readiness Procedure. Track lessons learned for incorporation into Plant or corporate documents. Ensure action tracking is used to implement the changes prior to the next winter season.

15. When seasonal conditions warrant, secure the Plant from the winter operational line-ups and configuration using Plant-specific procedures and/or checklists.

16. Conduct a post season Plant critique meeting following the Winter Readiness period before **April 15**. Identify and budget items needed for next year's seasonal readiness in the Plant budget.

17. For those areas that may be susceptible to predictable high winds and other extreme storm related conditions where additional preparations beyond those defined in the Winter period, the following actions shall be completed to mitigate the consequences of an event.

A. When conditions exist that may lead to high winds or other extreme storm related conditions the following actions shall be initiated:

- The Operations Manager or designee shall walk down the property to identify materials or debris that could become airborne during high wind conditions. Action shall be taken to secure or remove the hazards to ensure that equipment or personnel are not injured during the condition.
- Increase operator attention during the high wind or storm conditions to identify new hazards. Operators shall not put their own safety at risk.
- Plant facility backlogs shall be reviewed for work orders where equipment or material could become airborne during high wind conditions such as building siding, roofing material, or protective coverings.

B. Plants that are frequently challenged by these conditions are to develop Plant-specific procedures as required, to ensure these hazards are controlled and mitigated.

C. Other procedures that should be reviewed under these conditions include Plant abnormal operations procedures.

18. Failure to maintain the Battery Room temperature [redacted] MAY result in degrading the discharge capability of the battery should a loss of offsite power occur.
19. Failure to maintain the electrical package room temperature [redacted] MAY result in degrading the discharge capability of the batteries should a loss of offsite power occur.
20. Failure to maintain the caustic system temperature [redacted] WILL result in the freezing of the caustic and could potentially lead to a water Plant shutdown.
21. IF an instrument is suspected of freezing, THEN the instrument indication SHALL be monitored to verify reliability.
22. IF an instrument indication is unreliable, THEN an alternate method of monitoring the affected process variable SHOULD be established.
23. IF an instrument freezes, THEN actions SHALL be taken to return the instrument to service.
24. Out-of-Service equipment SHALL be evaluated for cold weather preparation (e.g., isolation/draining of tanks, isolation/draining non-essential equipment, installing temporary shelters, installing temporary heaters, and installing temporary insulation).
25. Follow Electrical Safety Precautions of EHS-17 (Electrical Safety) when accessing Heater Controls. Open, energized circuits exist inside the heater control enclosures.

26. The blank on the right side of certain steps of the checklist are for tracking completion of important activities. The blank can be initialed by either the person performing the procedure step or the person responsible for ensuring the step is completed as directed (e.g., the CRO can initial for the Yard Watch performed actions, etc...).

27. The cooling tower fans will be operated as needed depending on weather conditions and heat load on the cooling tower.

6.0 REFERENCES

CPN-714 (Records Management)

CSN-101 (Work Management Program)

Management of Design Change

7.0 RECORDS

Any records generated as a result of this process shall be filed and retained in accordance with CPN-714 (Records Management). Processes and procedures referenced in this document shall prescribe any specific records requirements within those documents.

9.0 SUPPORT DOCUMENTS

PRE-WINTER READINESS
Winter Readiness Action Timeline
Typical Winter Readiness Certification Letter
Maintenance Manager Pre-Winter Walk down (Critical Equipment Walk down)
Pre-Winter Building Heater Checklist
Pre-Winter Portable Heater Checklist
Pre-Winter Heat Trace System Review
Pre-Winter Obrien Box Review
Pre-Winter System Readiness Check Sheet
Pre-Winter System Readiness Review Worksheet
Pre-Winter Windbreak Protection Installation Checklist
Winter Readiness Gang Box Inventory Sheet
EXTREME-WINTER READINESS

WEATHER CONDITION CHECKLISTS
Cold Weather Checklist – Severe Condition 1
Cold Weather Checklist – Severe Condition 2
Cold Weather Checklist – Severe Condition 3

ATTACHMENTS

ATTACHMENT 3 – Winter Readiness Critical Transmitters
ATTACHMENT 4a – Obrien Box Review

ATTACHMENT 4b – Obrien Box Review
ATTACHMENT 5a – Heat Trace Panel Checklist
ATTACHMENT 5b – Heat Trace Panel Checklist
ATTACHMENT 6a – Windbreak Protection Checklist
ATTACHMENT 6b – Windbreak Protection Checklist
ATTACHMENT 7 – Room Temperature Log Sheet
ATTACHMENT 8 – Freeze Protection Supplemental Log Sheet
ATTACHMENT 9 – Instrument Air Low Point Drains Checklist

Cold Weather Checklist – Severe Weather Condition 1

To be used when the outside air temperature decreases to, **OR** is predicted to decrease to, **LESS THAN** or **EQUAL** to [redacted] but **GREATER** than [redacted].

		Initials/Date
1	Verify that the caustic system heat trace circuit is functional and ensure the heater control is ON.	
2	The Operations Manager SHALL review the LOTO database for ALL equipment tagged out.	
3	Verify chemical inventories are sufficient to support plant operations and identify any critical shipments expected during the cold weather forecasted period. Critical deliveries SHALL include margin (time and volume) of existing inventory.	
4	Verify fuel supplies (e.g., diesel fuel, gasoline, kerosene, propane, etc...) are sufficient to support plant operations and identify any critical shipments expected during the cold weather forecasted period.	
5	Begin monitoring lube oil temperature on cycled units and remove cooler from service if needed.	
6	ENSURE **Attachment 03** (Winter Readiness Critical Transmitters) is completed. Attachment 03 is to be completed once per winter season; after it's completed for the season, add N/A in the initials box.	

NOTE: ALL attachments listed above that correspond with Severe Weather Condition 1 will be color coded with a ***green*** header and bold ***black*** text.

Cold Weather Checklist – Severe Weather Condition 2

To be used when the outside air temperature decreases to, **OR** is predicted to decrease to, **LESS THAN** or **EQUAL** t[redacted] but **GREATER** than[redacted]

		Initials/Date
1	ENSURE all Freeze Protection Systems are operating per Pre-Winter System Readiness Check Sheet.	
2	ENSURE all instrument enclosure Obrien Boxes are operable per **Attachment 04a**, which shall be performed once per shift for this condition.	
3	ENSURE Freeze Protection Panels are in operation and in automatic per **Attachment 05a**, which shall be performed once per shift for this condition.	
4	ENSURE Temporary Wind Breaks/Enclosures are installed and inspected at the following locations per **Attachment 06a**, which shall be performed once per shift for this condition.	
5	ENSURE **Attachment 07a** (Room Temperature Log Sheet) is initiated once per shift to monitor the room temperatures based on ambient air temperature. The Plant Manager MAY request room temperature logs be taken at shorter intervals of time as the weather dictates.	
6	Monitor lube oil temperature on cycled units and remove cooler from service if needed.	
7	ENSURE ALL other accessory and plant doors are kept closed.	
8	SUSPEND all discretionary maintenance that could affect plant availability.	
9	Tune Aux. Boilers and CTGs as necessary for compliance.	
10	Verify chemical inventories are sufficient to support plant operations and identify any critical shipments expected during the cold weather forecasted period. Critical deliveries SHALL include margin (time and volume) of existing inventory.	
11	Verify fuel supplies (e.g., diesel fuel, gasoline, kerosene, propane, etc...) are sufficient to support plant operations and identify any critical shipments expected during the cold weather forecasted period.	

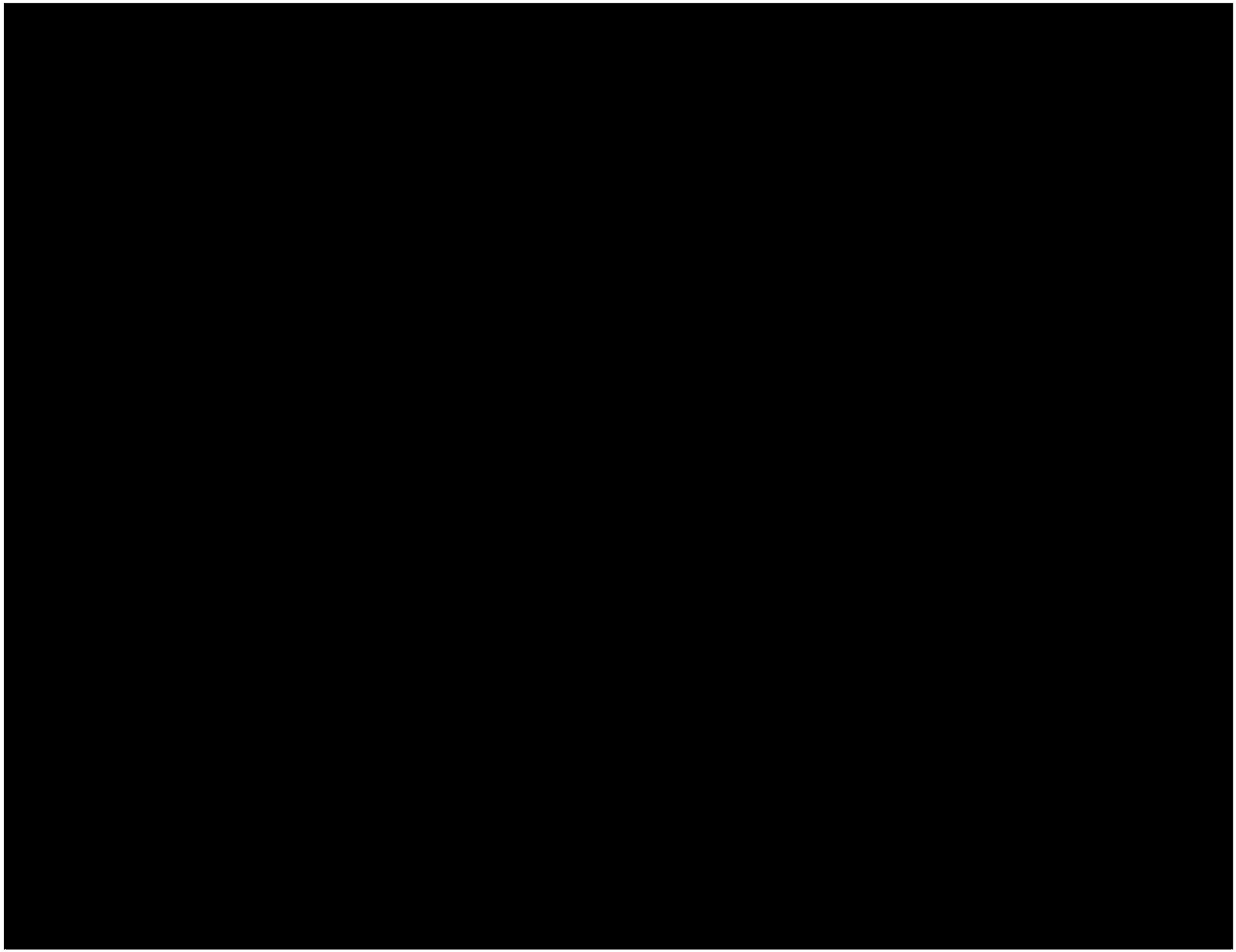
NOTE: ALL attachments listed above that correspond with Severe Weather Condition 2 will be color coded with a ***yellow*** header and bold ***black*** text.

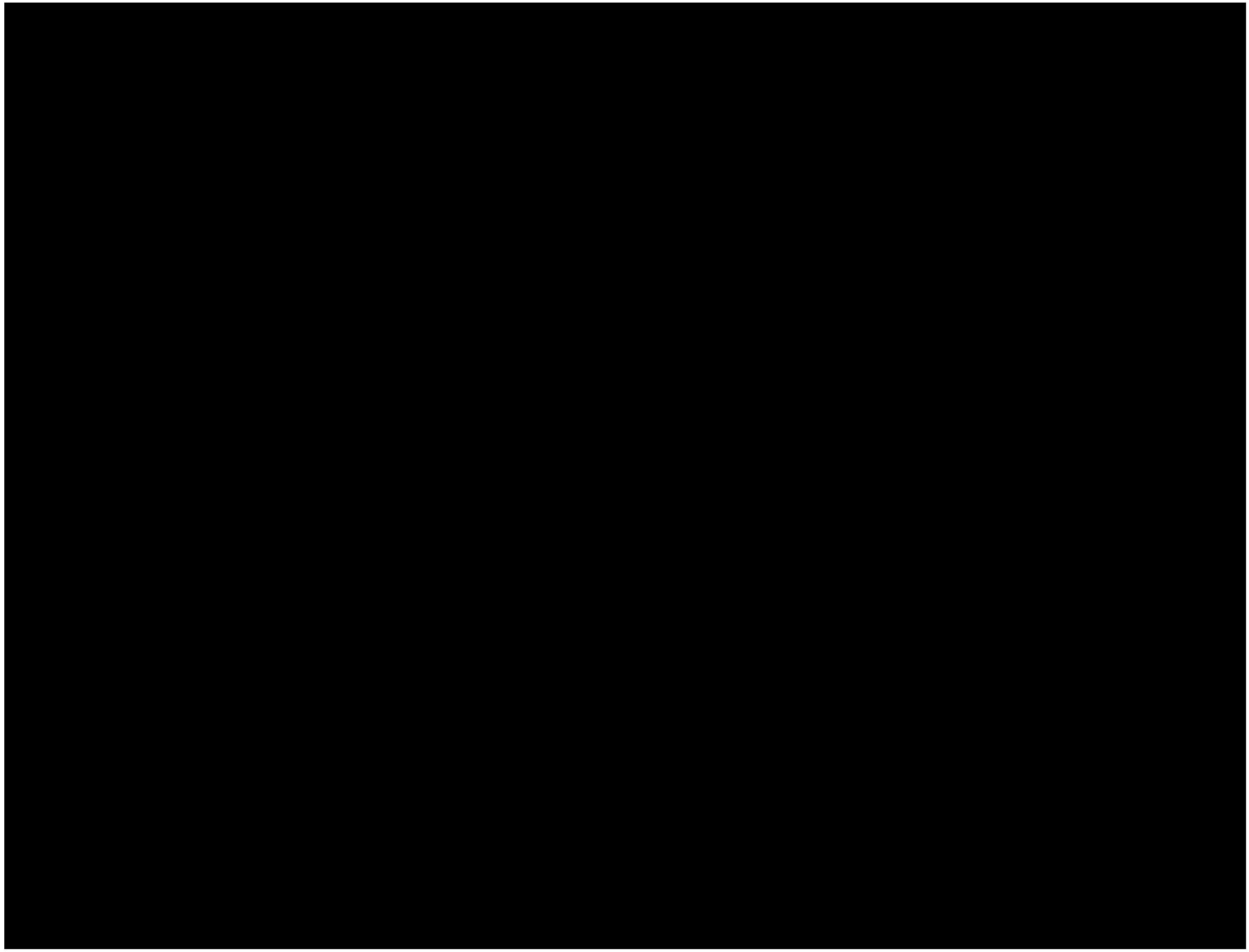
Cold Weather Checklist – Severe Weather Condition 3

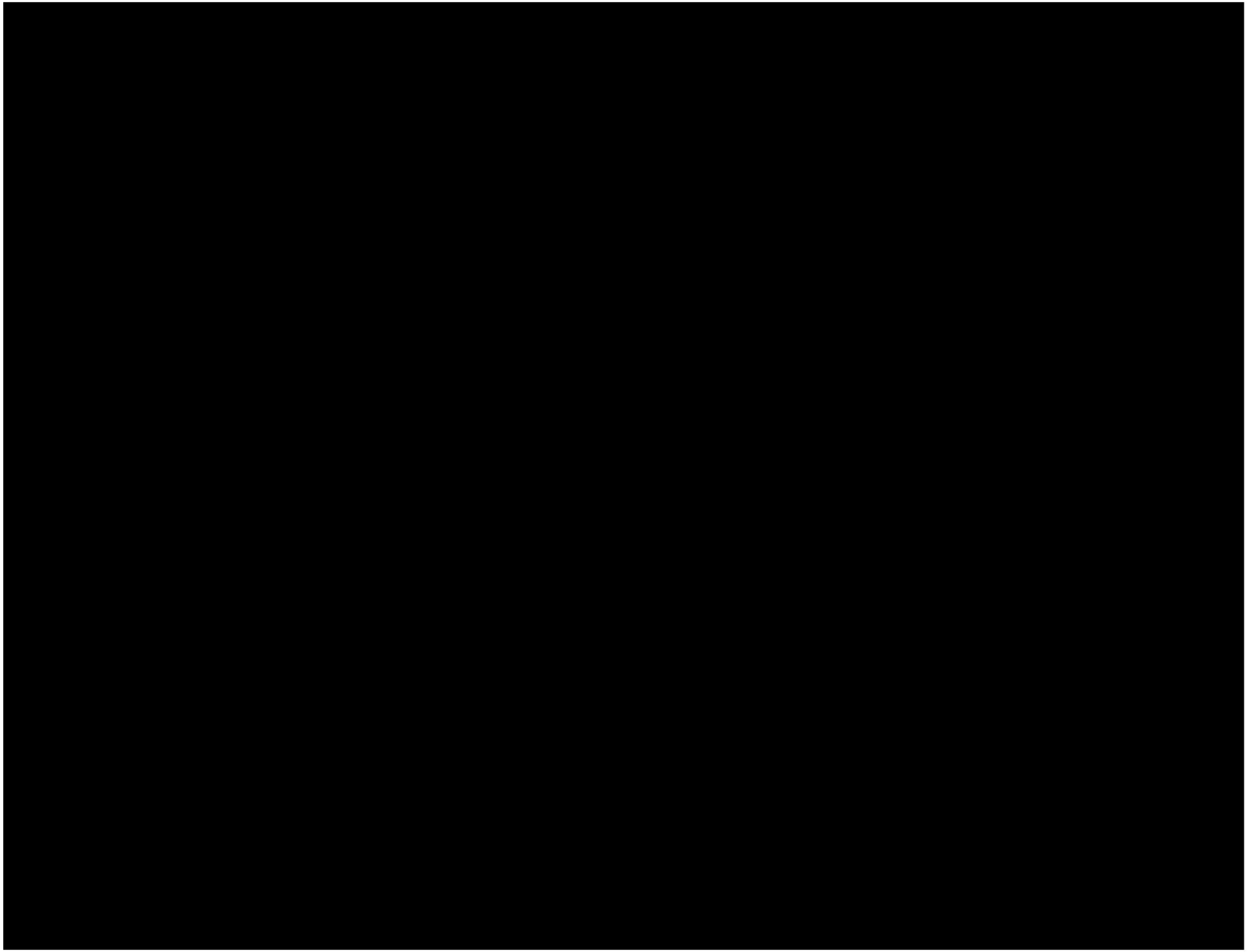
To be used when the outside air temperature decreases to, **OR** is predicted to decrease to, **LESS THAN** or **EQUAL** to [redacted]

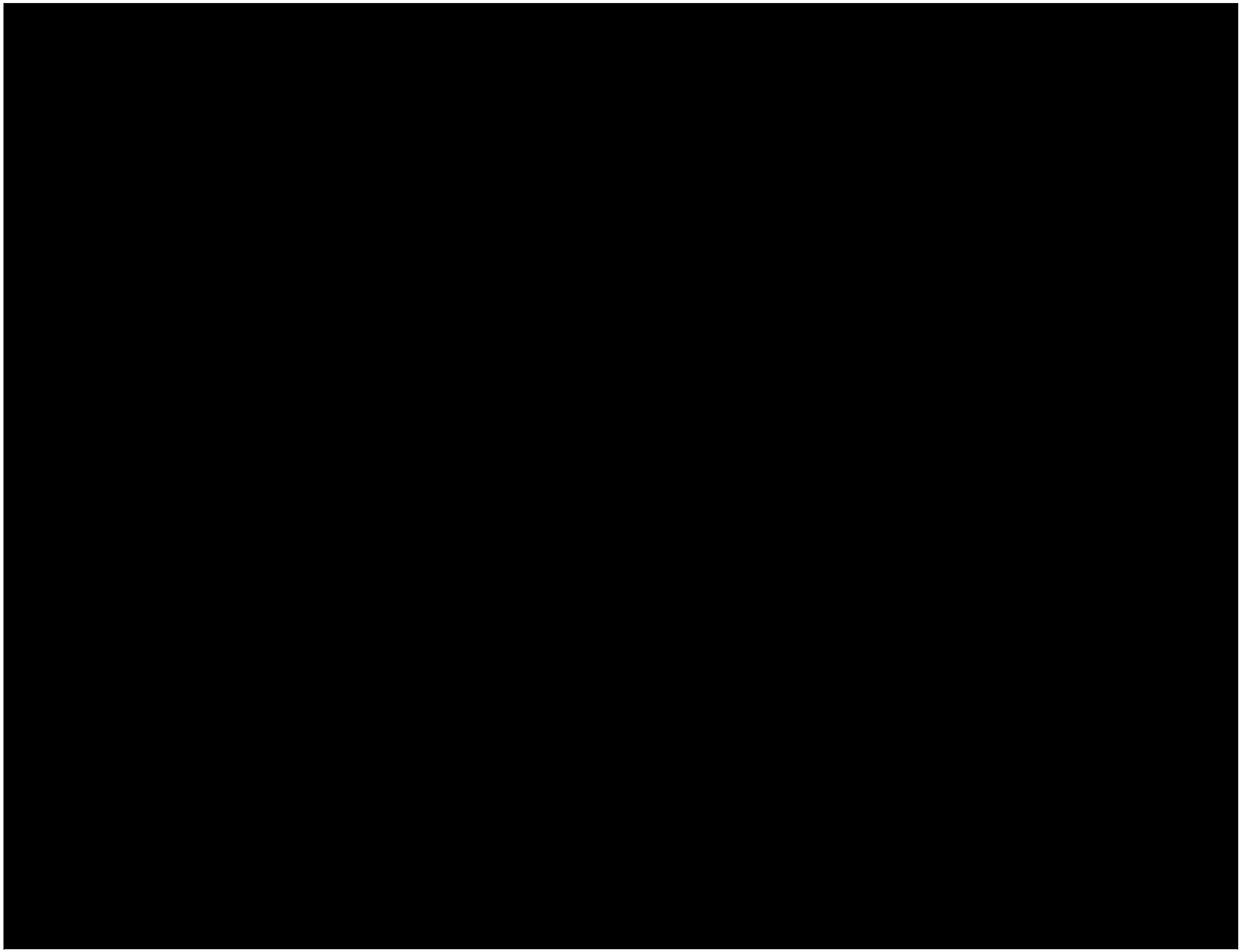
		Initials/Date
1	ENSURE the Operations or Maintenance Manager is assigned to provide backshift managerial coverage during winter weather event as directed by and at the discretion of the Plant Manager.	
2	ENSURE Operations and Maintenance staffing levels are increased to provide around the clock coverage as directed by and at the discretion of the Plant Manager.	
3	ENSURE sufficient food, blankets, cots, drinking water, etc. is available at the plant should roads become impassable due to inclement weather.	
4	Using DCS screen/trends, monitor the transmitters listed on **Attachment 03** (Winter Readiness Critical Transmitters). This attachment is listed in Severe Weather Condition 1 folder.	
5	ENSURE all instrument enclosure Obrien Boxes are operable per **Attachment 04b**, which shall be performed twice per shift for this condition. The Plant Manager MAY request the log be taken at shorter intervals of time as the weather dictates.	
6	ENSURE Freeze Protection Panels are in operation and in automatic per **Attachment 05b**, which shall be performed twice per shift for this condition. The Plant Manager MAY request the log be taken at shorter intervals of time as the weather dictates.	
7	ENSURE Temporary Wind Breaks/Enclosures are installed and inspected at the following locations per **Attachment 06b**, which shall be performed twice per shift for this condition. The Plant Manager MAY request the log be taken at shorter intervals of time as the weather dictates.	
8	ENSURE **Attachment 07b** (Room Temperature Log Sheet) is initiated to monitor the room temperatures twice per shift based on ambient air temperature. The Plant Manager MAY request room temperature logs be taken at shorter intervals of time as the weather dictates.	
9	ENSURE **Attachment 08** (Freeze Protection Supplemental Log Sheet) is initiated, which shall be performed once per shift for this condition. The Plant Manager MAY request the log be taken at shorter intervals of time as the weather dictates.	
10	ENSURE **Attachment 09** (Instrument Air Low Point Drains Checklist) is initiated, which shall be performed once per shift for this condition. The Plant Manager MAY request the log be taken at shorter intervals of time as the weather dictates.	

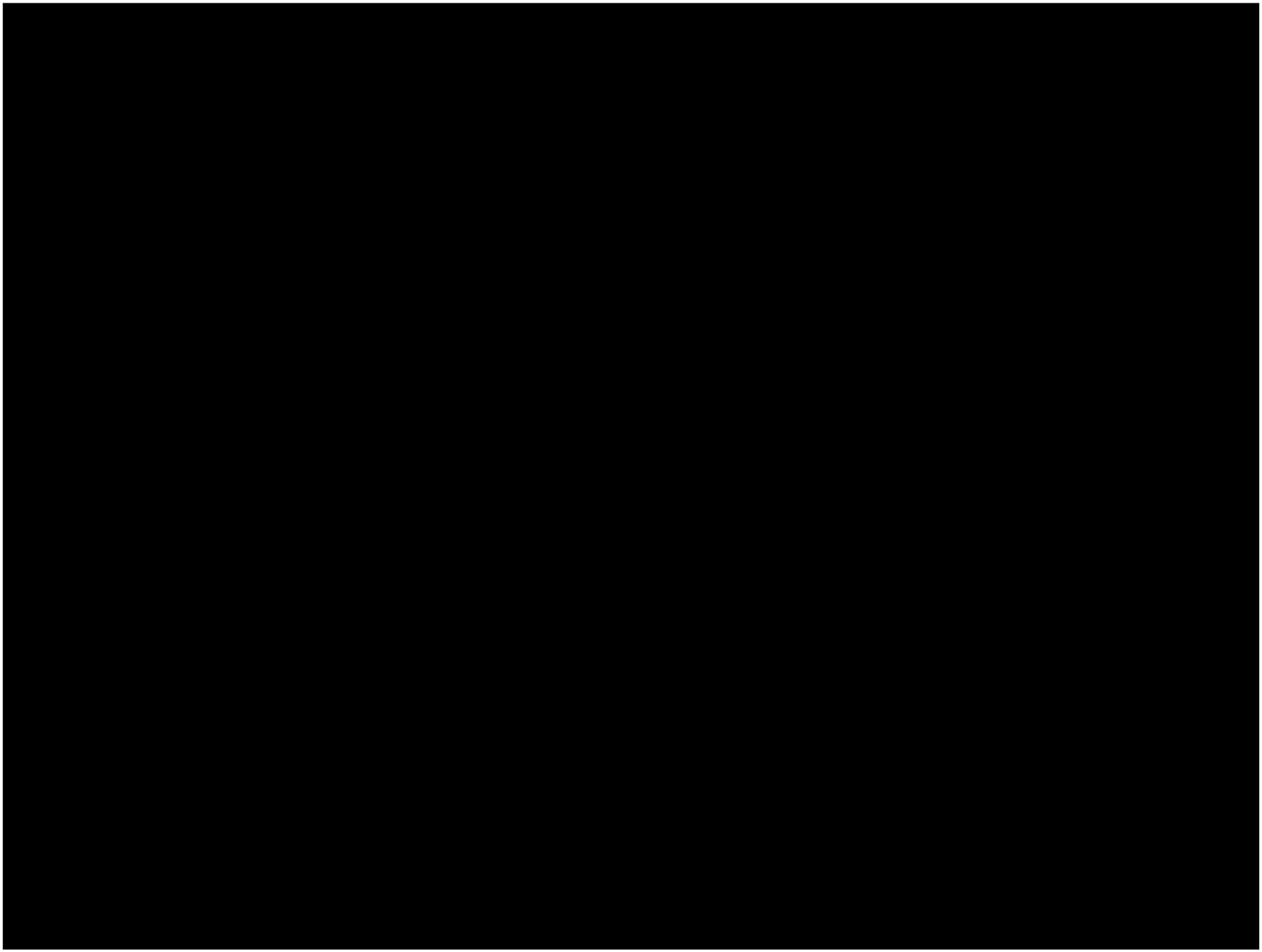
NOTE: ALL attachments listed above that correspond with Severe Weather Condition 3 will be color coded with a ***red*** header and bold ***black*** text.

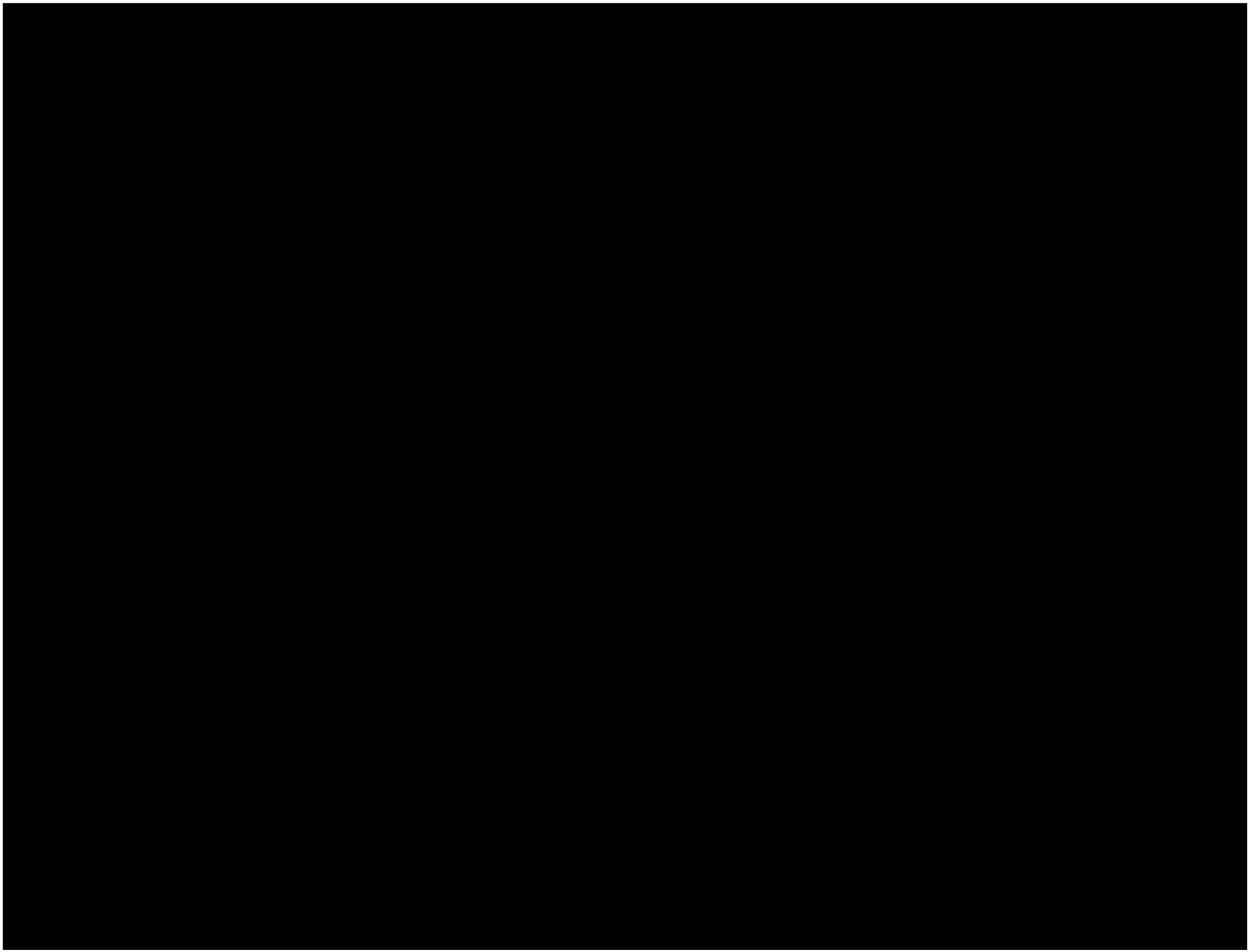


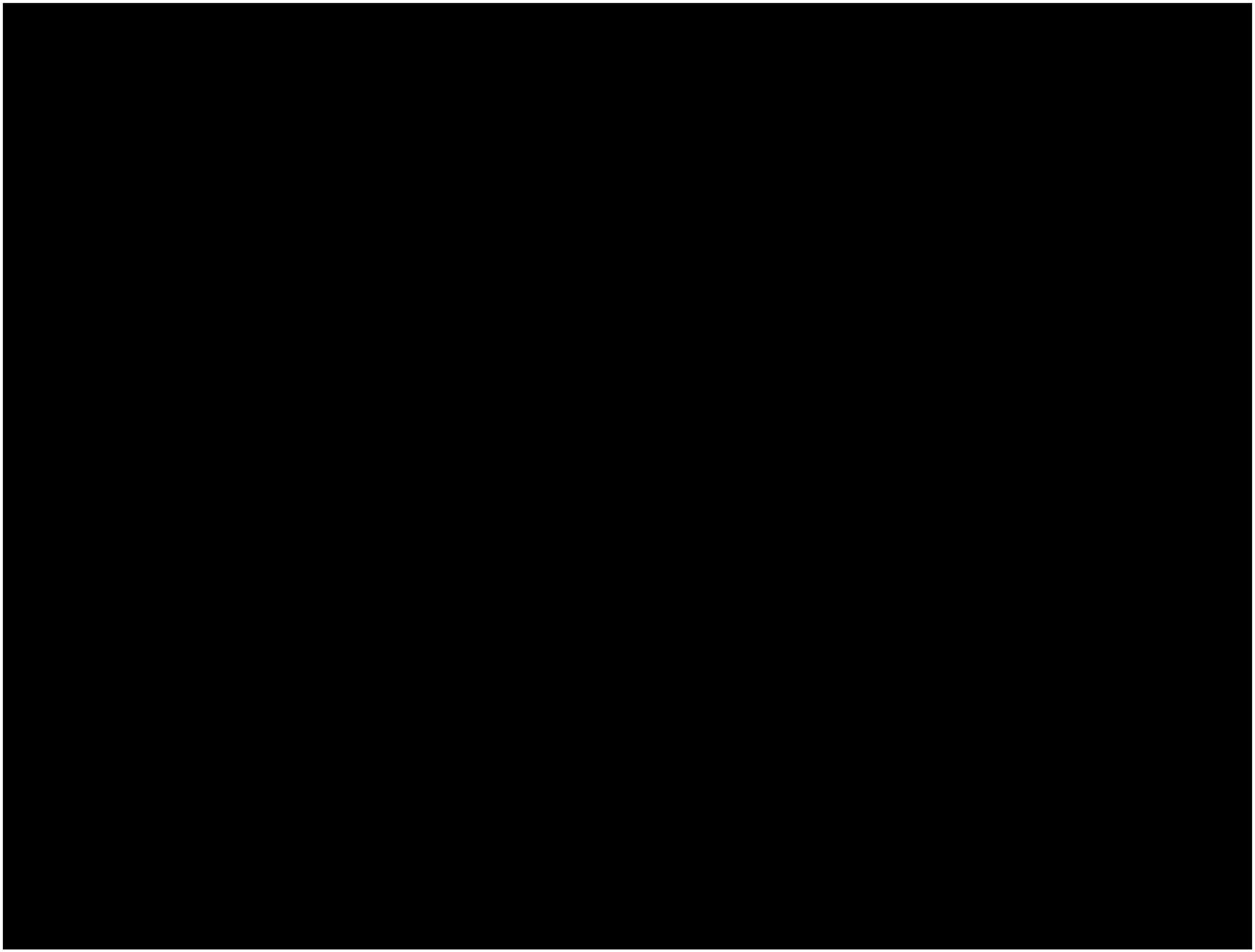


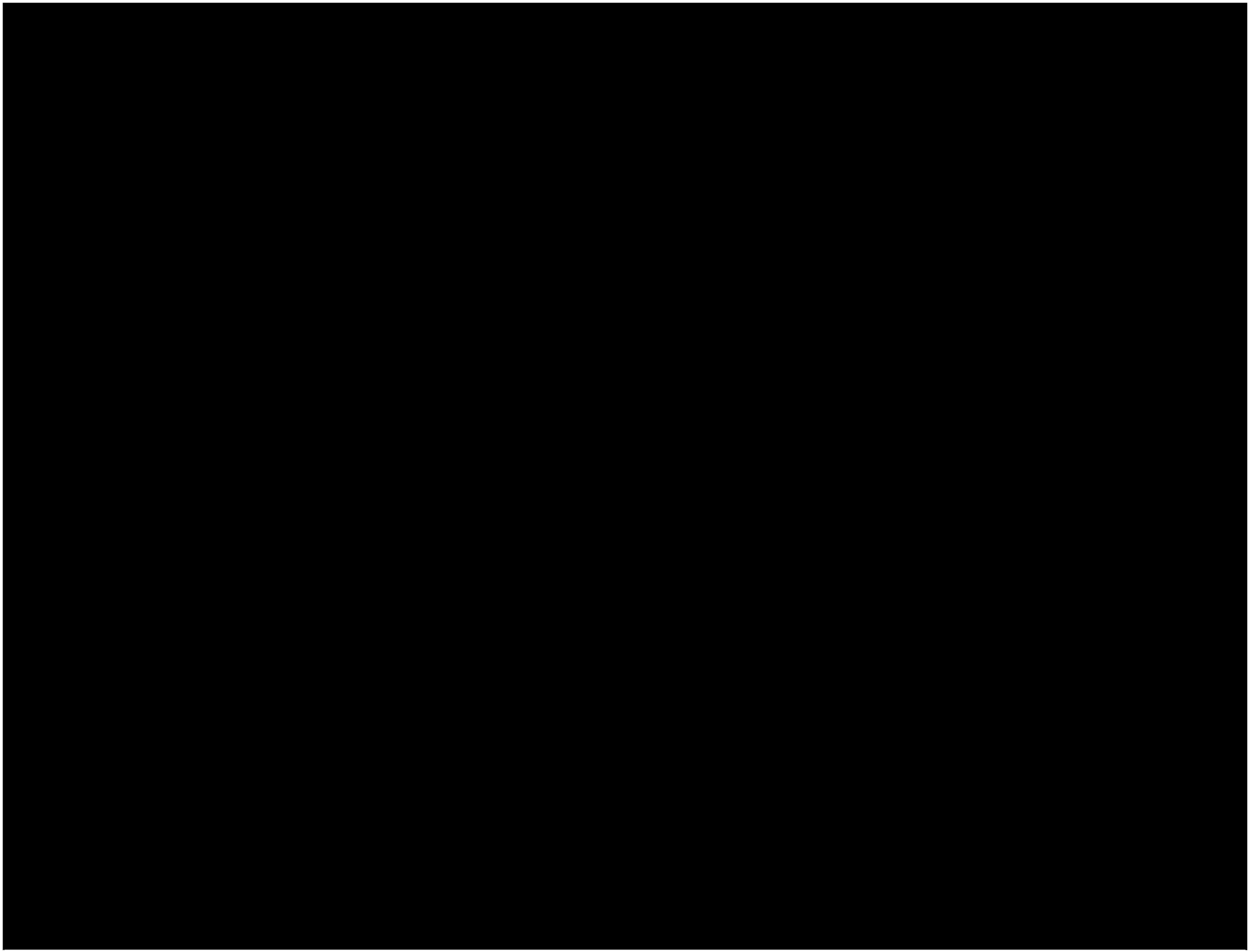


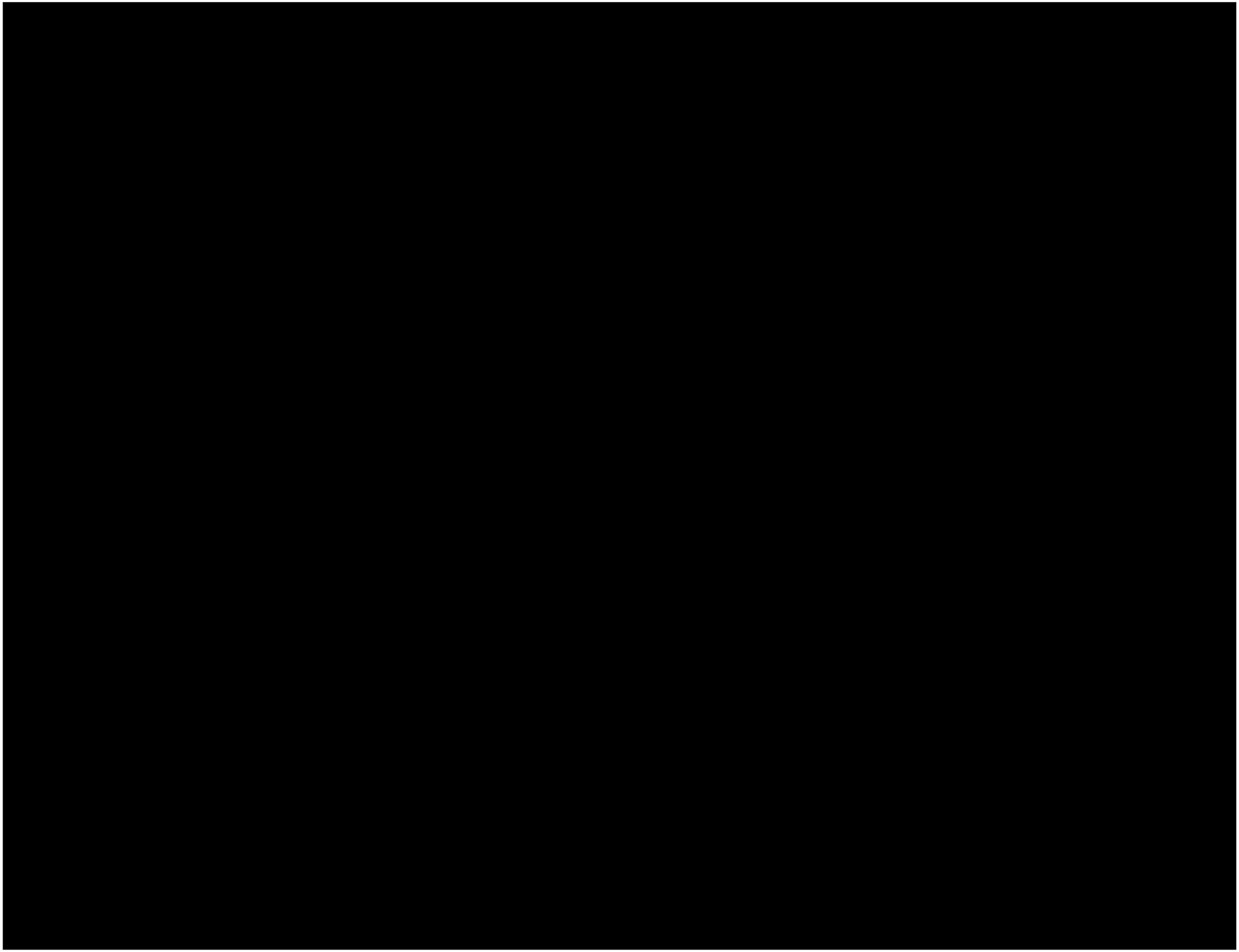


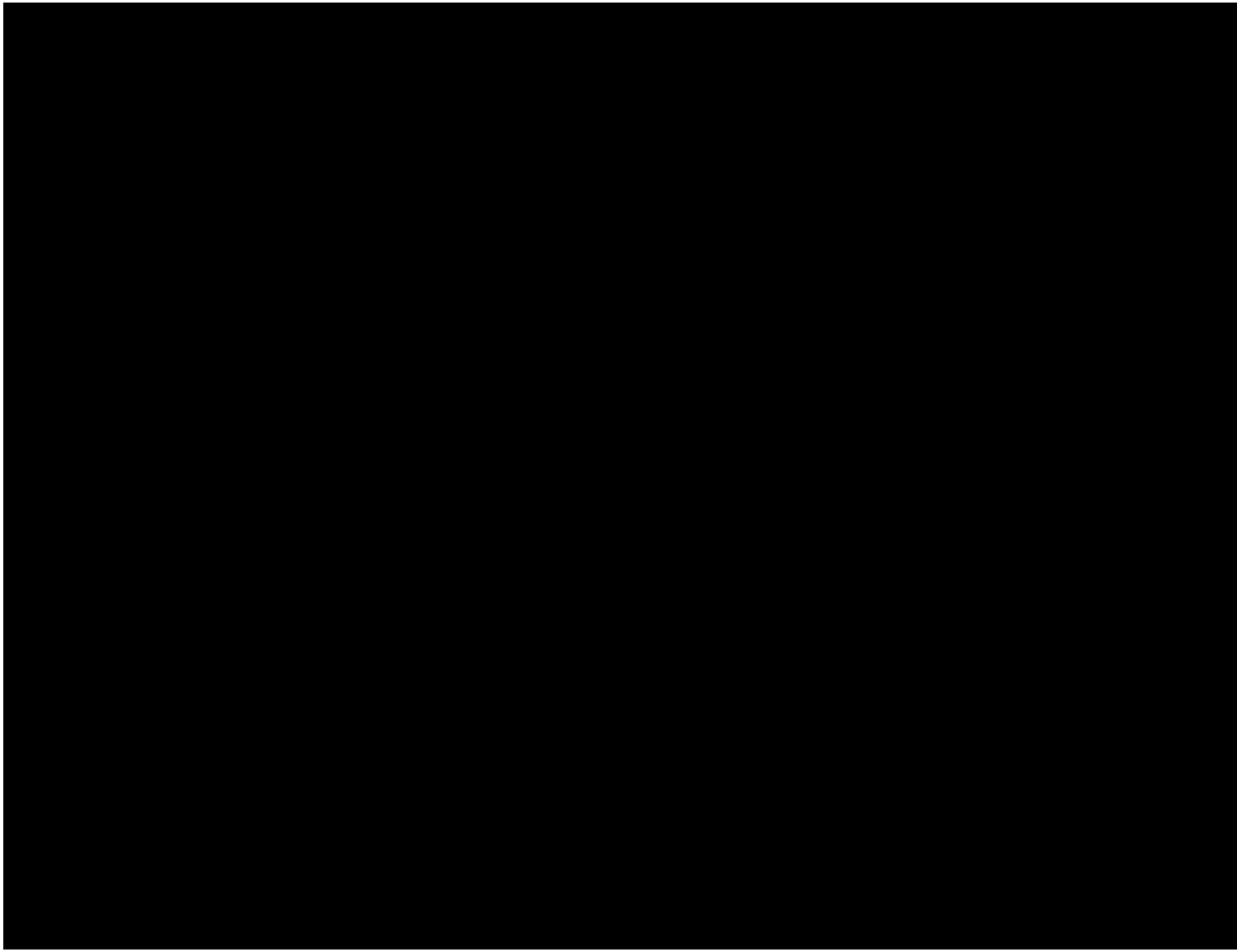












PROCEDURE NUMBER: REVISION: 2

Attachment 04b **Obrien Box Checklist** Date:

****Other associated Checklists/Attachments for Condition 3****

Attachment 05b	Attachment 06b	Attachment 07b
Attachment 08	Attachment 09	

COMMENTS:

PROCEDURE NUMBER: REVISION: 1

Attachment 05a **Heat Trace Panel Checklist** Date:

NOTE: THIS LOG SHEET IS FOR SEVERE WEATHER CONDITION 2,
ADD INITIALS IN BOXES BELOW FOR THE CORRESPONDING TIME INTERVAL THE INSPECTION TOOK PALCE

HEAT TRACE PANEL CHECKLIST			
HEAT TRACE PANEL		**Shift**	**Shift**
CT1		**0430 - 1630**	**1630 - 0430**
Verify Heat Tracing Panel is energized at HRSG 1	**Ambient Temp**		
	Initials		
	Comments:		
CT1		**0430 - 1630**	**1630 - 0430**
Verify HRSG 1 Supplemental Heat Trace Is Active (Red Light On Top Of HRSG 1)	**Ambient Temp**		
	Initials		
	Comments:		
CT2		**0430 - 1630**	**1630 - 0430**
Verify Heat Tracing Panel is energized at HRSG 2	**Ambient Temp**		
	Initials		
	Comments:		
CT2		**0430 - 1630**	**1630 - 0430**
Verify HRSG 1 Supplemental Heat Trace Is Active (Red Light On Top Of HRSG 2)	**Ambient Temp**		
	Initials		
	Comments:		
CT3		**0430 - 1630**	**1630 - 0430**
Verify Heat Tracing Panel Is Energized At HRSG 3 (North Of PDC)	**Ambient Temp**		
	Initials		
	Comments:		
CT3		**0430 - 1630**	**1630 - 0430**
Verify Heat Tracing Panel Is Energized At HRSG 3 (East Of CEMS 3)	**Ambient Temp**		
	Initials		
	Comments:		
STG		**0430 - 1630**	**1630 - 0430**
Verify Heat Tracing Panel Is Energized At STG	**Ambient Temp**		
	Initials		
	Comments:		

AUX. BOILERS		0430 - 1630	1630 - 0430
Verify Heat Tracing Panel Is Energized At Auxiliary Boilers	**Ambient Temp**		
	Initials		
	Comments:		
BLANKING PLATES		**0430 - 1630**	**1630 - 0430**
Install Blanking Plates on CT1, CT2 and CT3 Battery Room Doors	**Ambient Temp**		
	Initials		
	Comments:		
SUT1 DELUGE BLDG		**0430 - 1630**	**1630 - 0430**
Verify Space Heater is in Service	**Ambient Temp**		
	Initials		
	Comments:		
SUT2 DELUGE BLDG		**0430 - 1630**	**1630 - 0430**
Verify Space Heater is in Service	**Ambient Temp**		
	Initials		
	Comments:		
SUT3 DELUGE BLDG		**0430 - 1630**	**1630 - 0430**
Verify Space Heater is in Service	**Ambient Temp**		
	Initials		
	Comments:		
SUT4 DELUGE BLDG		**0430 - 1630**	**1630 - 0430**
Verify Space Heater is in Service	**Ambient Temp**		
	Initials		
	Comments:		
NH3 DELUGE BLDG		**0430 - 1630**	**1630 - 0430**
Verify Space Heater is in Service	**Ambient Temp**		
	Initials		
	Comments:		

****Other associated Checklists/Attachments for Condition 2****

Attachment 04a	Attachment 06a
Attachment 07a	

PROCEDURE NUMBER: REVISION: 1

Attachment 05b **Heat Trace Panel Checklist** Date:

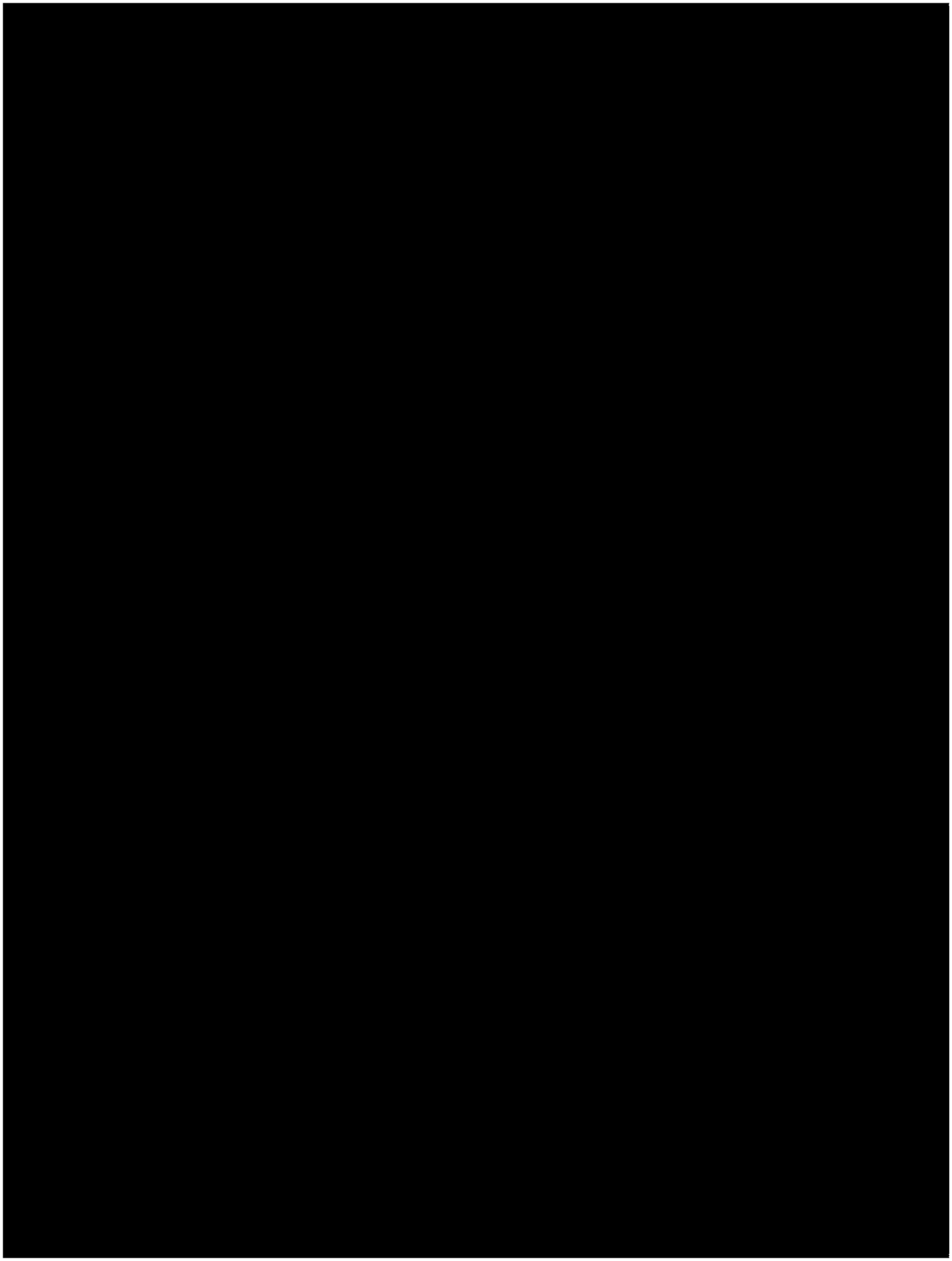
NOTE: THIS LOG SHEET IS FOR SEVERE WEATHER CONDITION 3,
ADD INITIALS IN BOXES BELOW FOR THE CORRESPONDING TIME INTERVAL THE INSPECTION TOOK PALCE

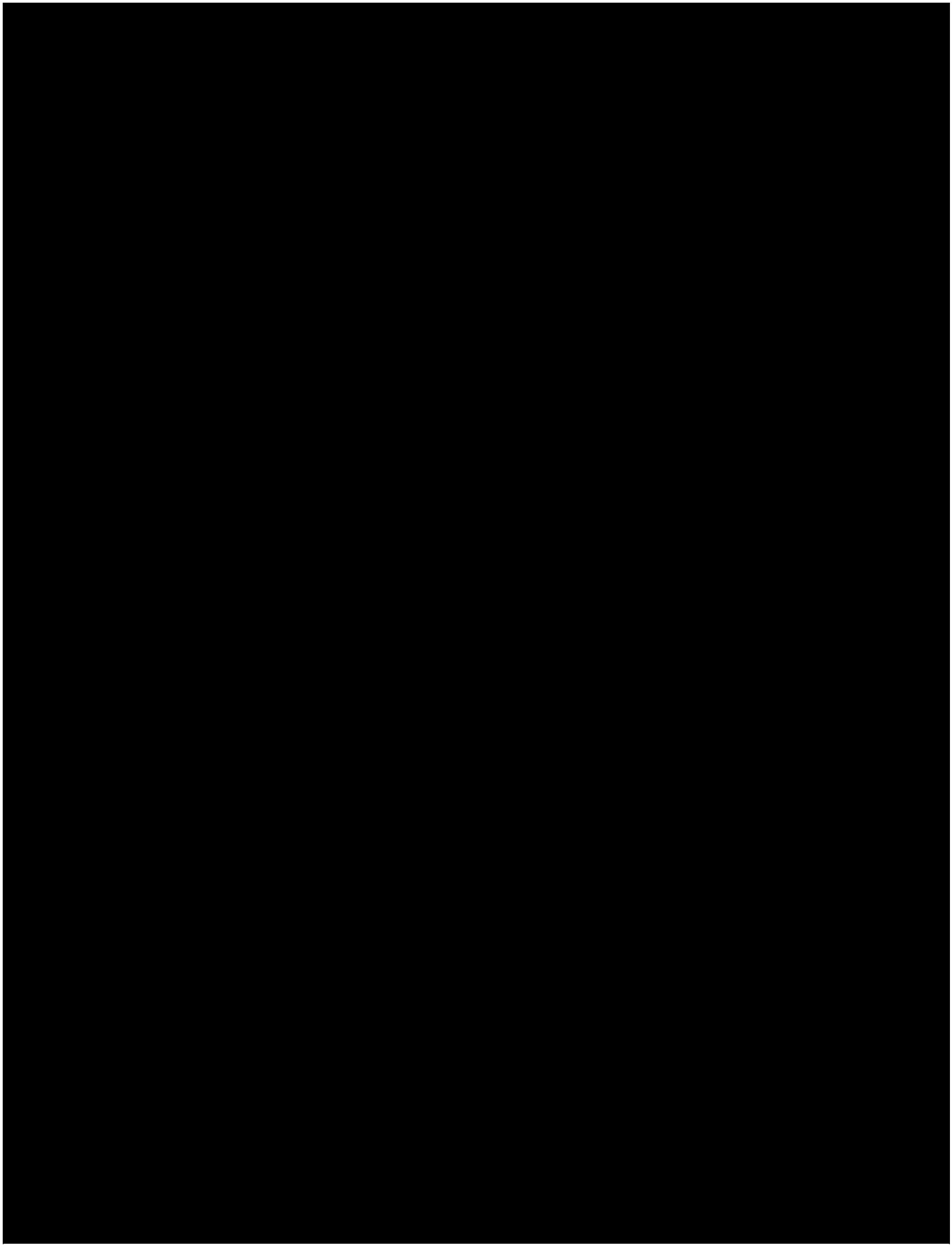
HEAT TRACE PANEL CHECKLIST					
HEAT TRACE PANEL		**Time**	**Time**	**Time**	**Time**
CT1		**0430 - 1030**	**1030 - 1630**	**1630 - 2230**	**2230 - 0430**
Verify Heat Tracing Panel is energized at HRSG 1	**Temperature**				
	Initials				
	Comments:				
CT1		**0430 - 1030**	**1030 - 1630**	**1630 - 2230**	**2230 - 0430**
Verify HRSG 1 Heat Trace is active (Red Light On Top Of HRSG 1)	**Temperature**				
	Initials				
	Comments:				
CT2		**0430 - 1030**	**1030 - 1630**	**1630 - 2230**	**2230 - 0430**
Verify Heat Tracing Panel is energized at HRSG 2	**Temperature**				
	Initials				
	Comments:				
CT2		**0430 - 1030**	**1030 - 1630**	**1630 - 2230**	**2230 - 0430**
Verify HRSG 2 Heat Trace is active (Red Light On Top Of HRSG 2)	**Temperature**				
	Initials				
	Comments:				
CT3		**0430 - 1030**	**1030 - 1630**	**1630 - 2230**	**2230 - 0430**
Verify Heat Tracing Panel is energized at HRSG 3 (North Of PDC)	**Temperature**				
	Initials				
	Comments:				
CT3		**0430 - 1030**	**1030 - 1630**	**1630 - 2230**	**2230 - 0430**
Verify Heat Tracing Panel is energized at HRSG 3 (East Of CEMS 3)	**Temperature**				
	Initials				
	Comments:				
STG		**0430 - 1030**	**1030 - 1630**	**1630 - 2230**	**2230 - 0430**
Verify Heat Tracing Panel is energized at STG	**Temperature**				
	Initials				
	Comments:				

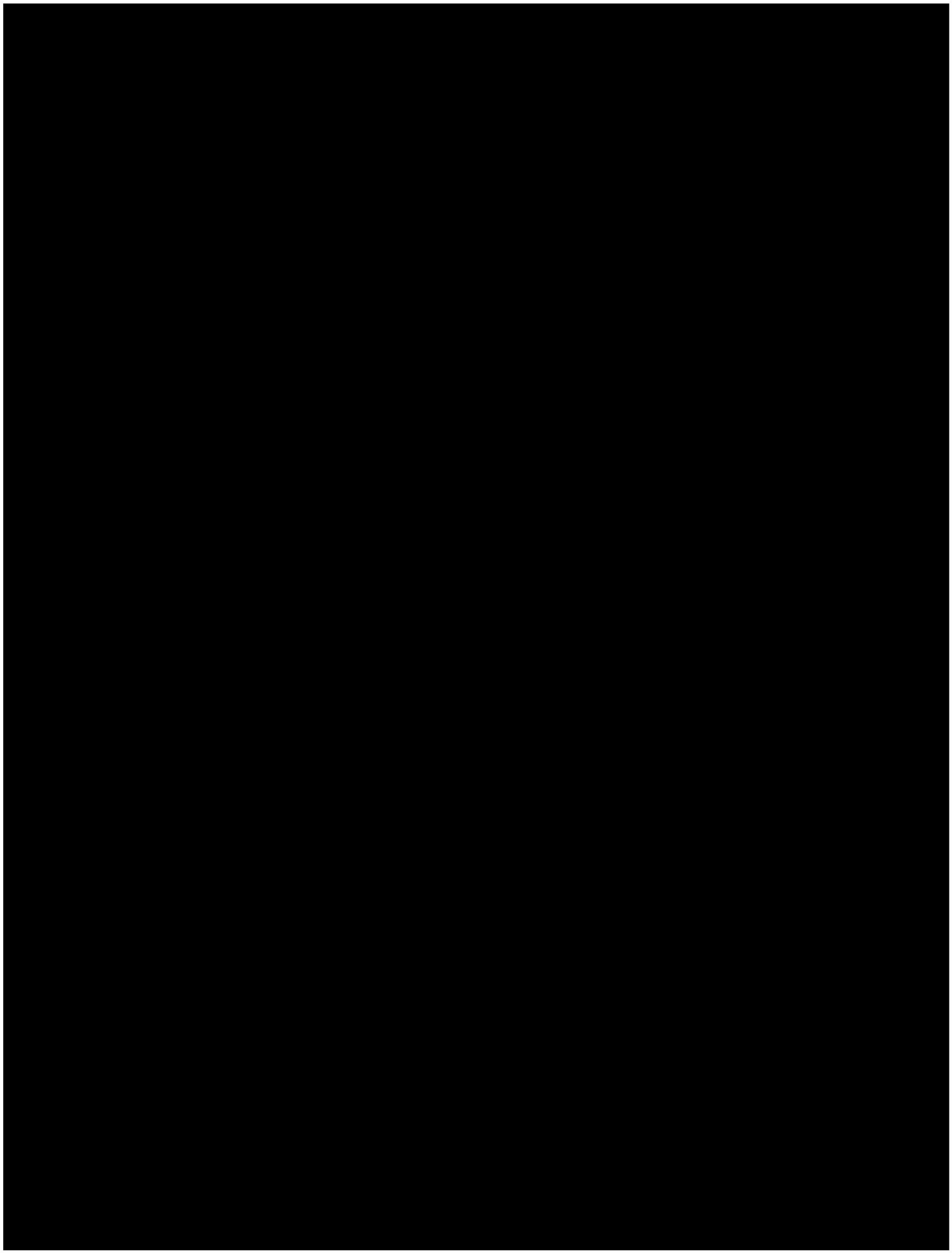
AUX. BOILERS		0430 - 1030	1030 - 1630	1630 - 2230	2230 - 0430
Verify Heat Tracing Panel is energized at Auxiliary Boilers	Temperature				
	Initials				
	Comments:				
BLANKING PLATES		**0430 - 1030**	**1030 - 1630**	**1630 - 2230**	**2230 - 0430**
Install Blanking Plates on CT1, CT2 and CT3 electrical batter compartment doors	Temperature				
	Initials				
	Comments:				
SUT1 DELUGE BLDG		**0430 - 1030**	**1030 - 1630**	**1630 - 2230**	**2230 - 0430**
Verify space heater is in service	Temperature				
	Initials				
	Comments:				
SUT2 DELUGE BLDG		**0430 - 1030**	**1030 - 1630**	**1630 - 2230**	**2230 - 0430**
Verify space heater is in service	Temperature				
	Initials				
	Comments:				
SUT3 DELUGE BLDG		**0430 - 1030**	**1030 - 1630**	**1630 - 2230**	**2230 - 0430**
Verify space heater is in service	Temperature				
	Initials				
	Comments:				
SUT4 DELUGE BLDG		**0430 - 1030**	**1030 - 1630**	**1630 - 2230**	**2230 - 0430**
Verify space heater is in service	Temperature				
	Initials				
	Comments:				
NH3 DELUGE BLDG		**0430 - 1030**	**1030 - 1630**	**1630 - 2230**	**2230 - 0430**
Verify space heater is in service	Temperature				
	Initials				
	Comments:				

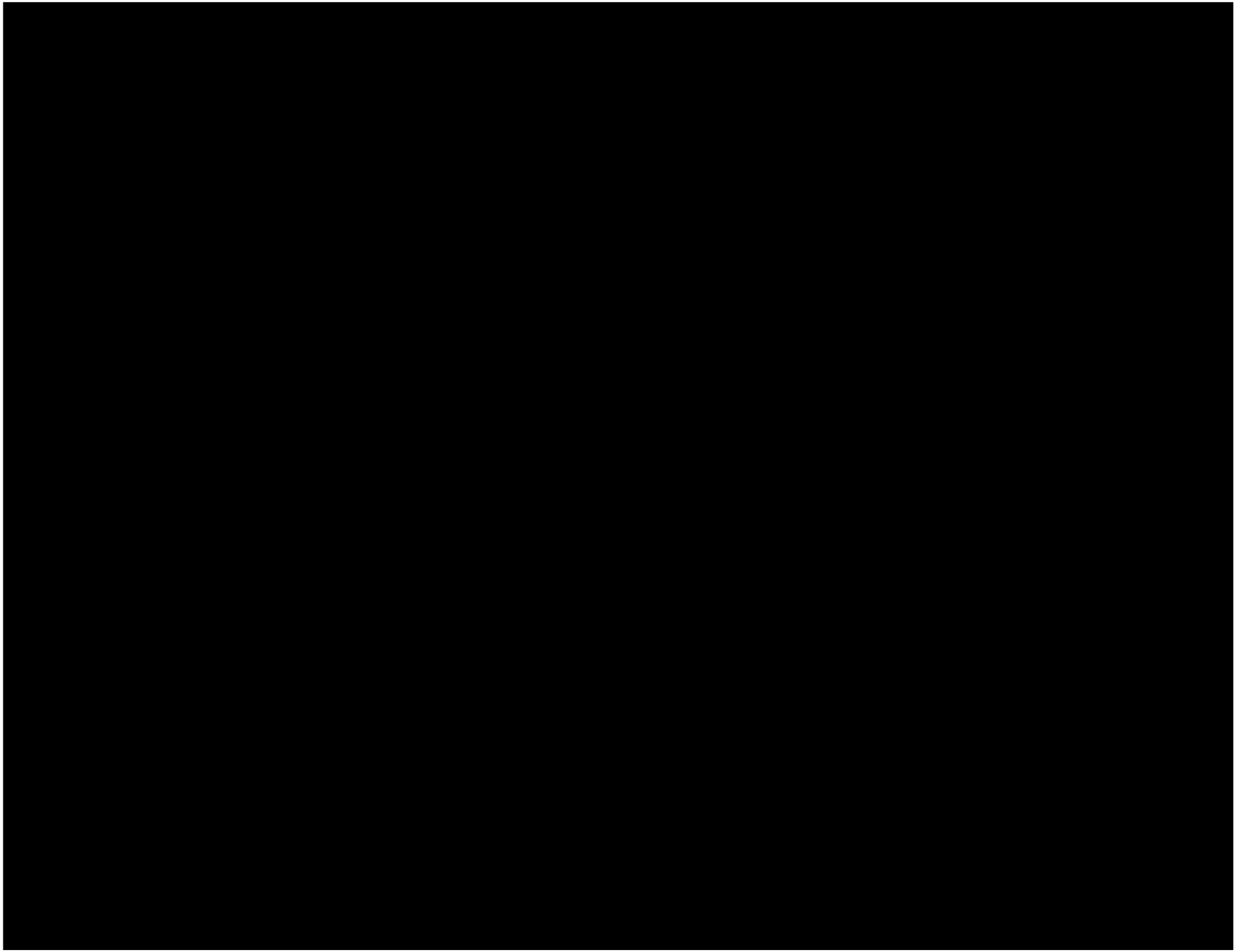
****Other associated Checklists/Attachments for Condition 3****

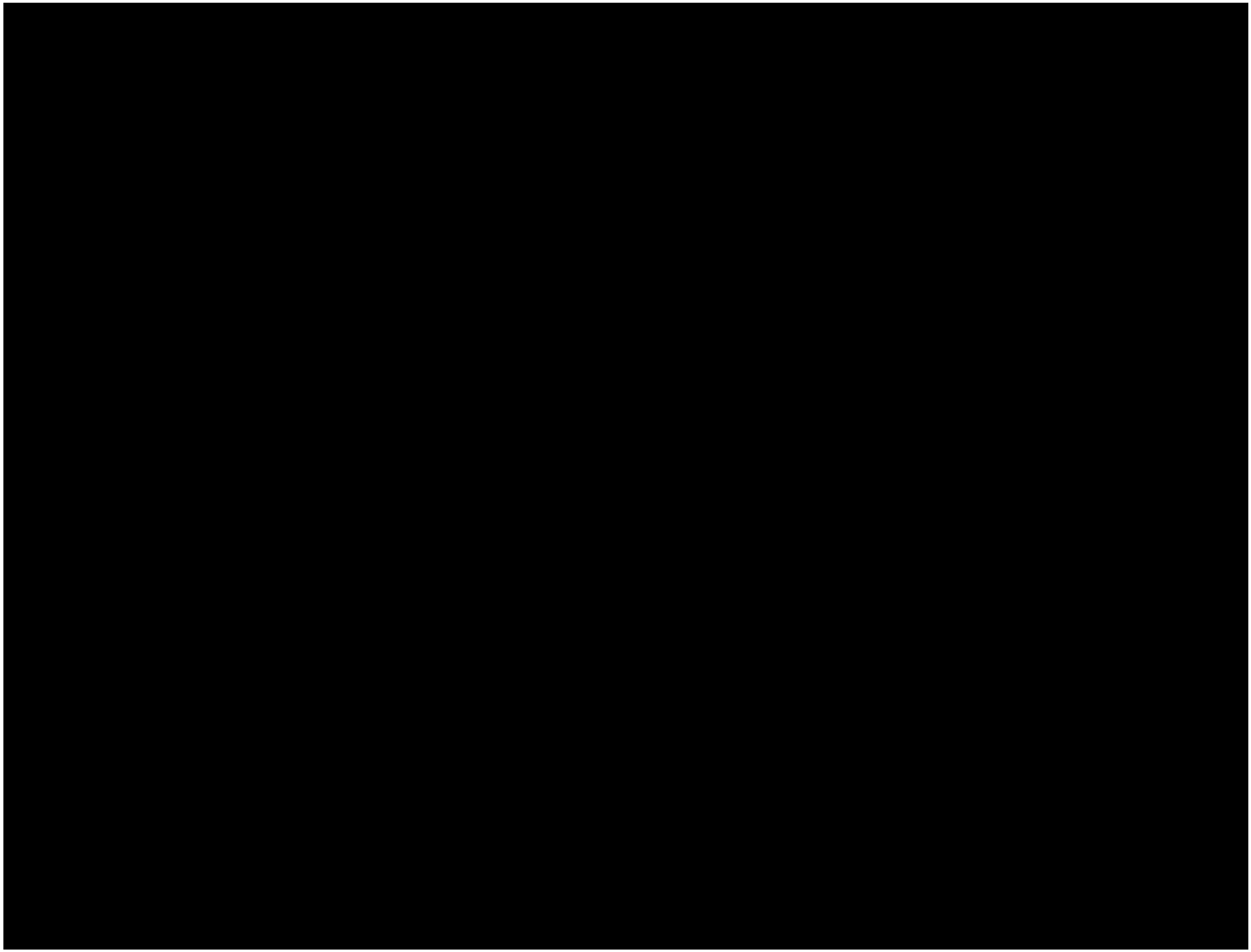
Attachment 04b	Attachment 06b	Attachment 07b
Attachment 08	Attachment 09	

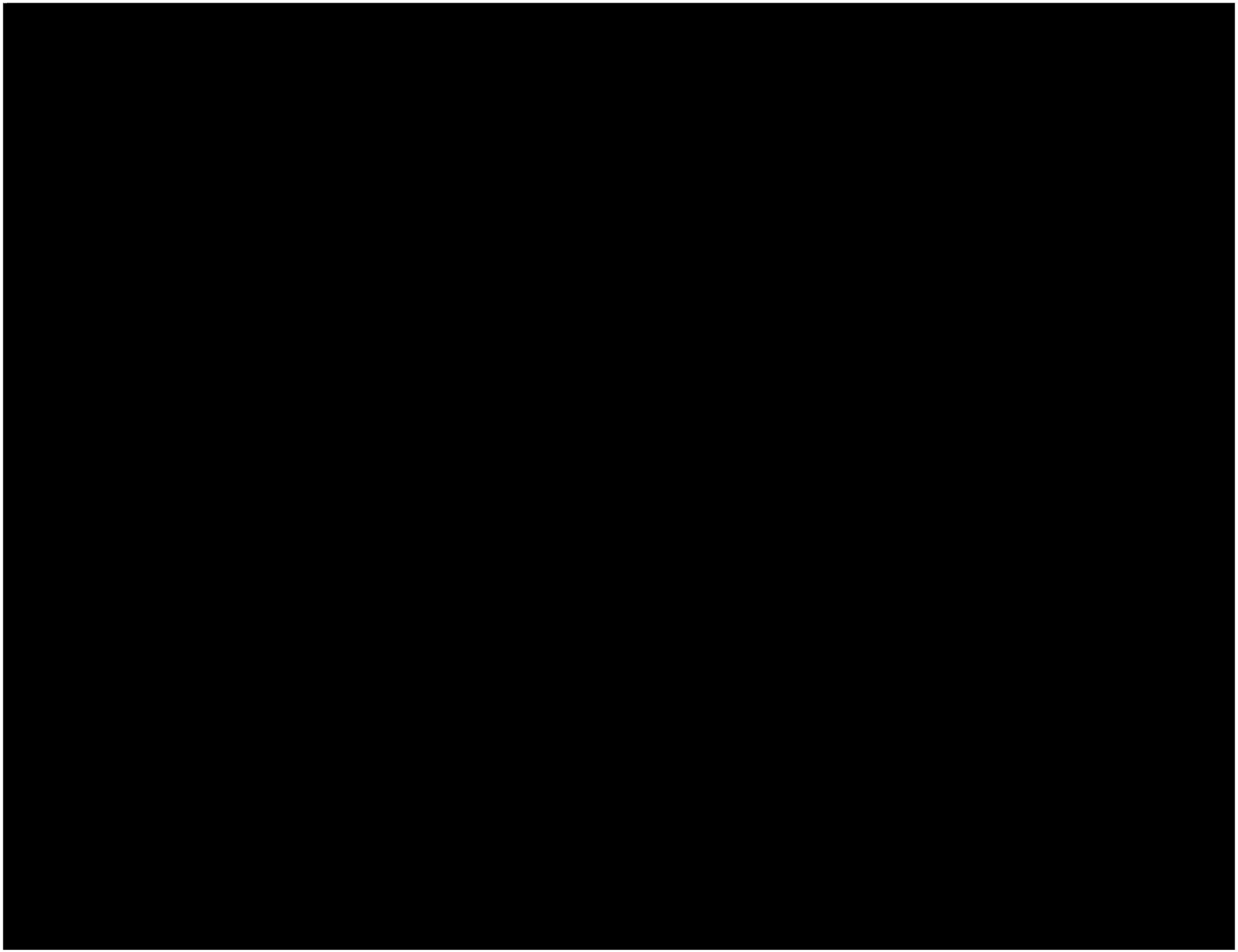


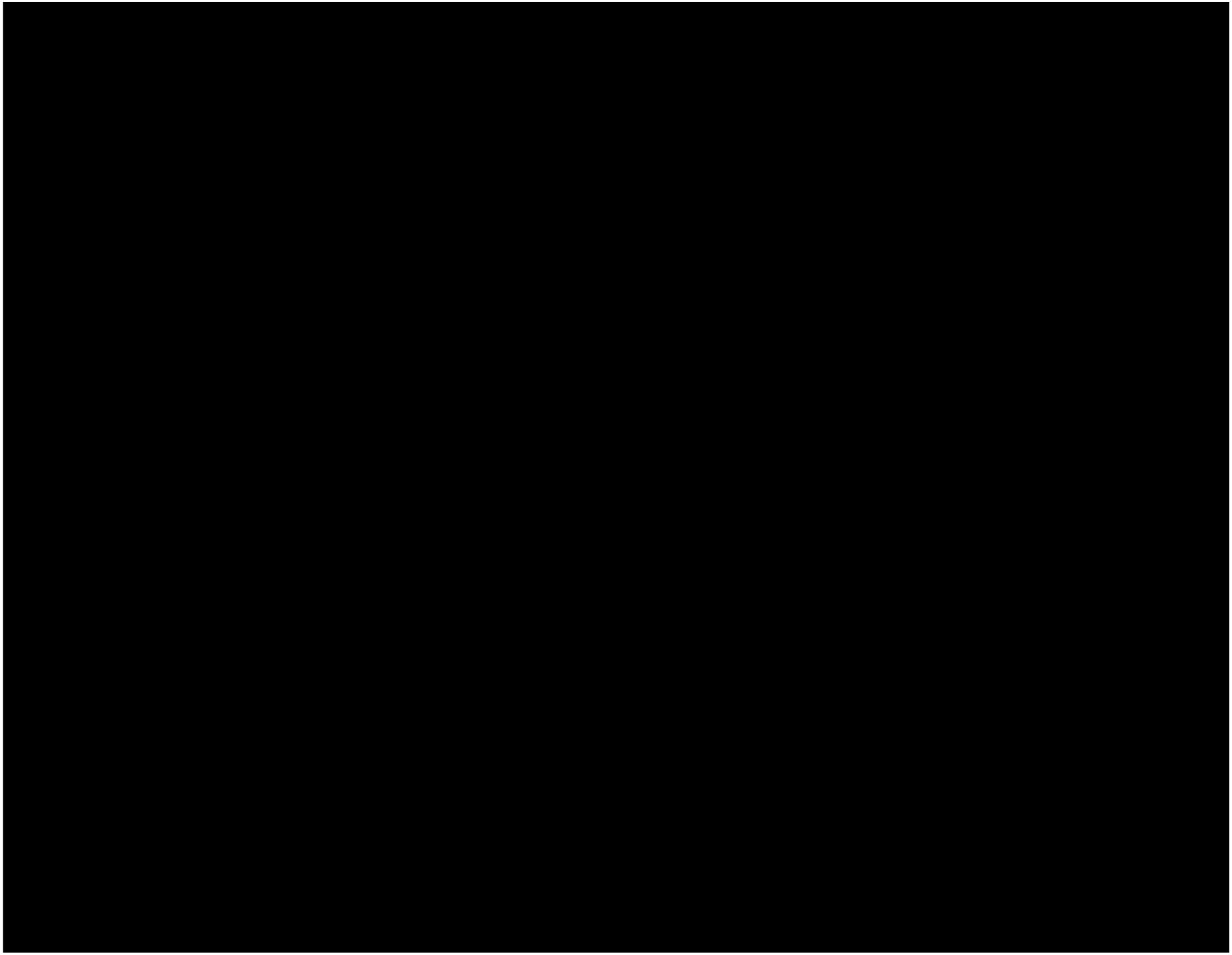


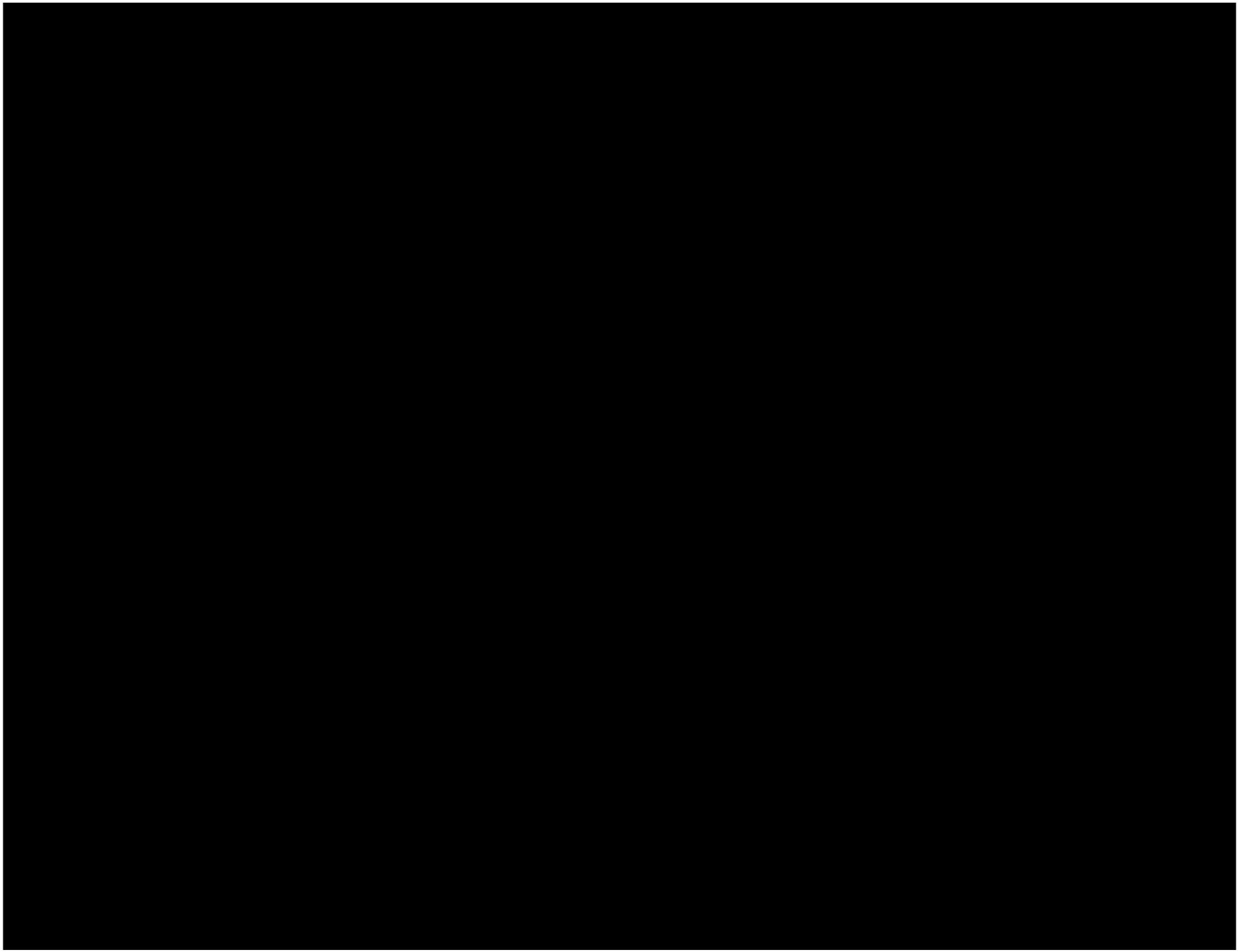


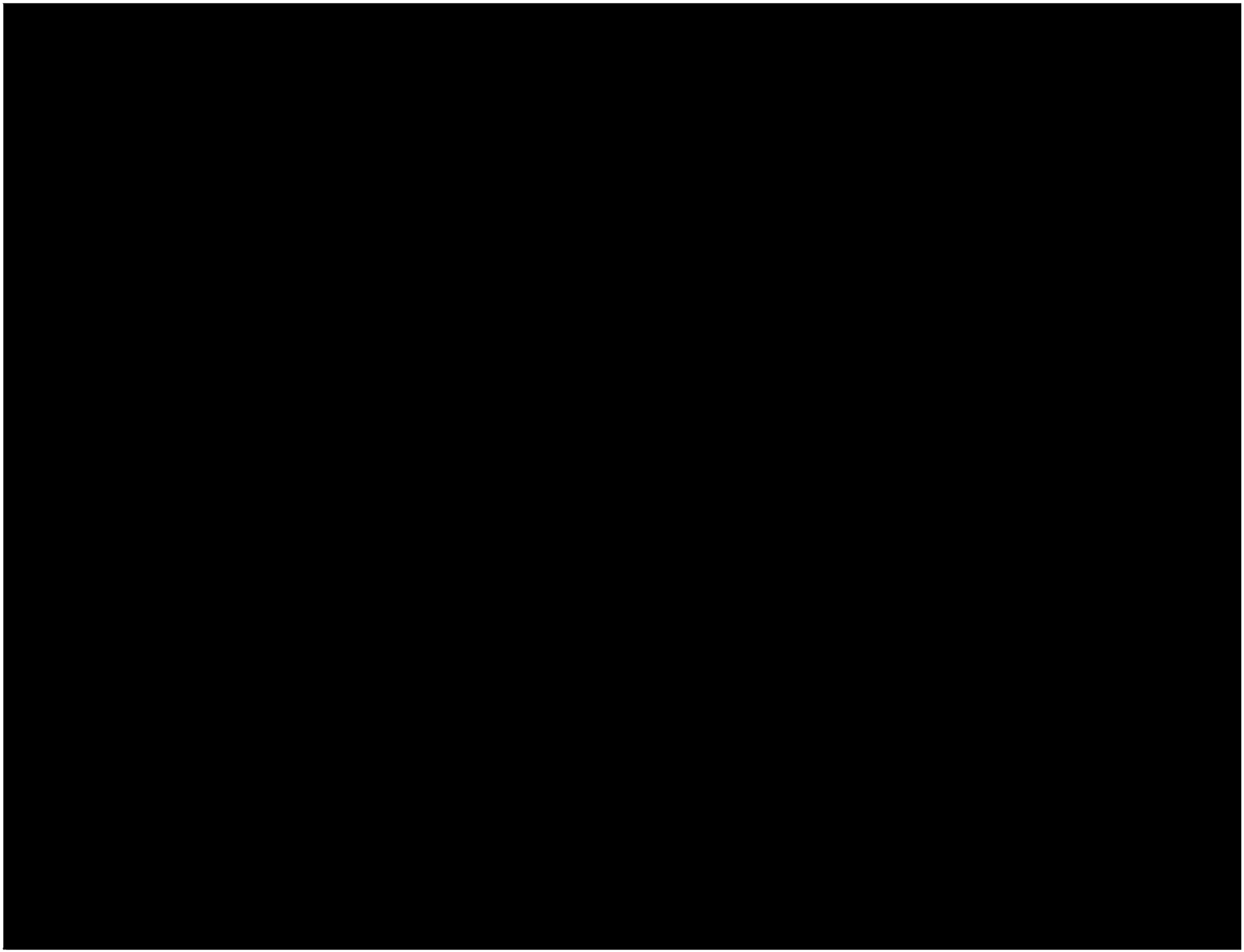


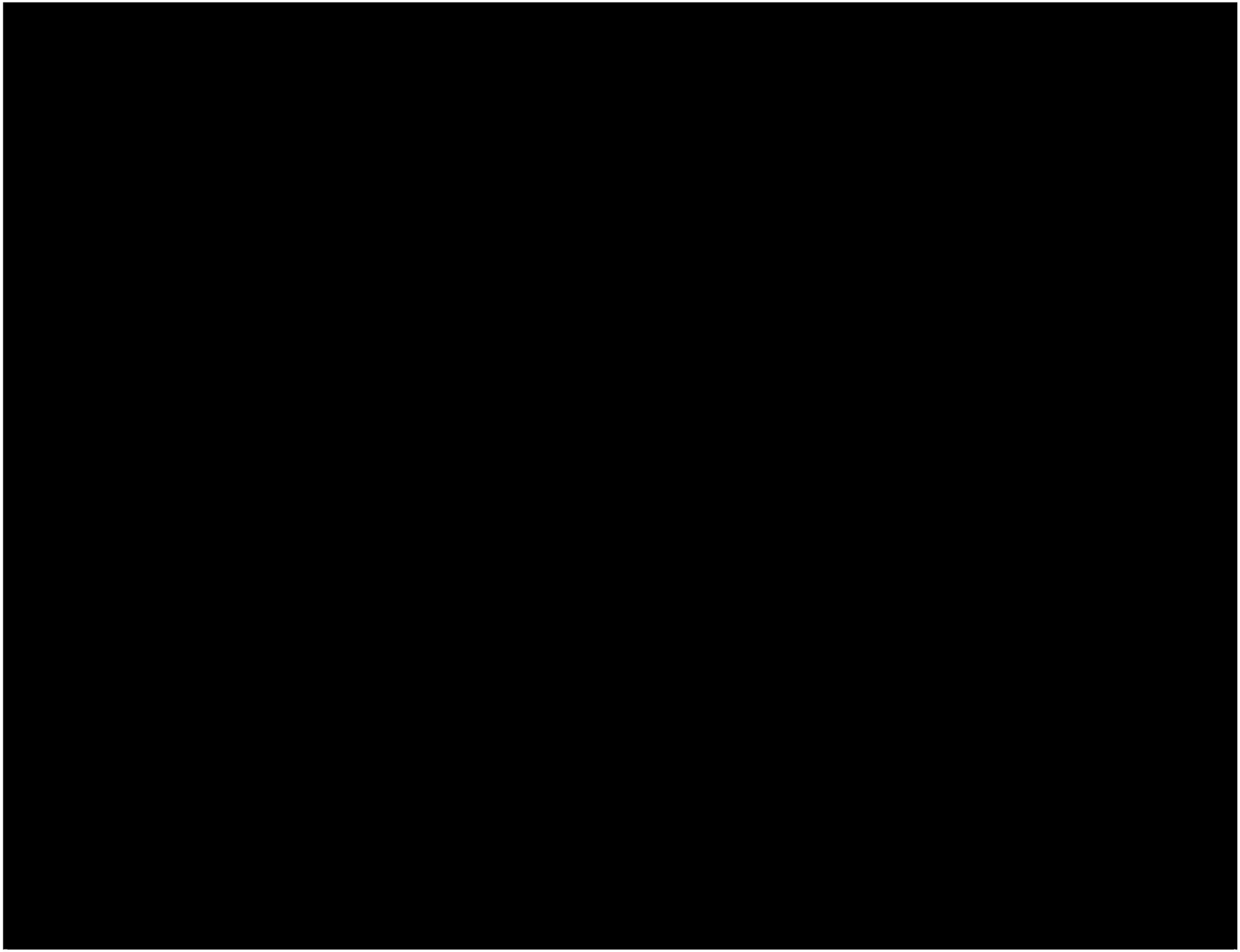


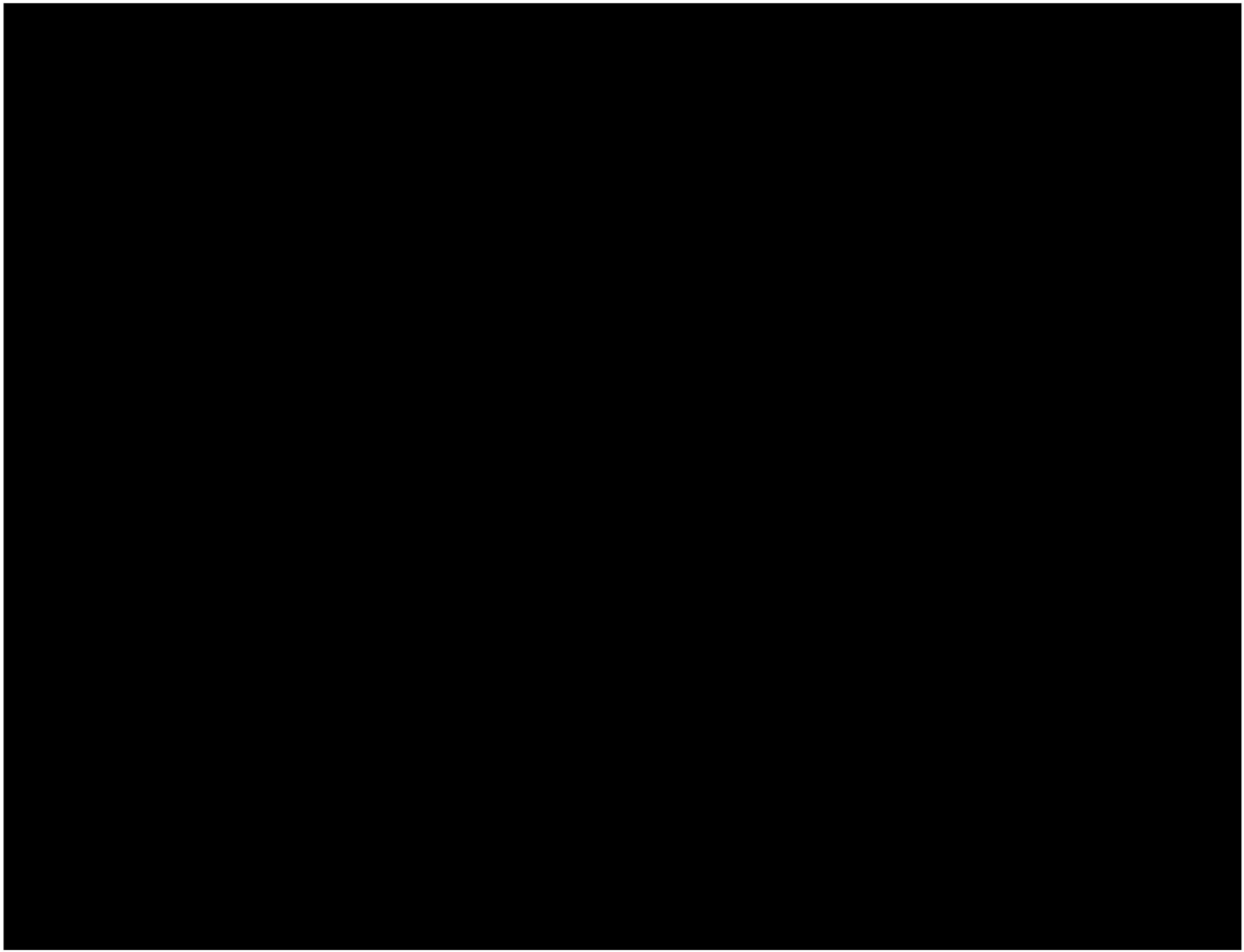


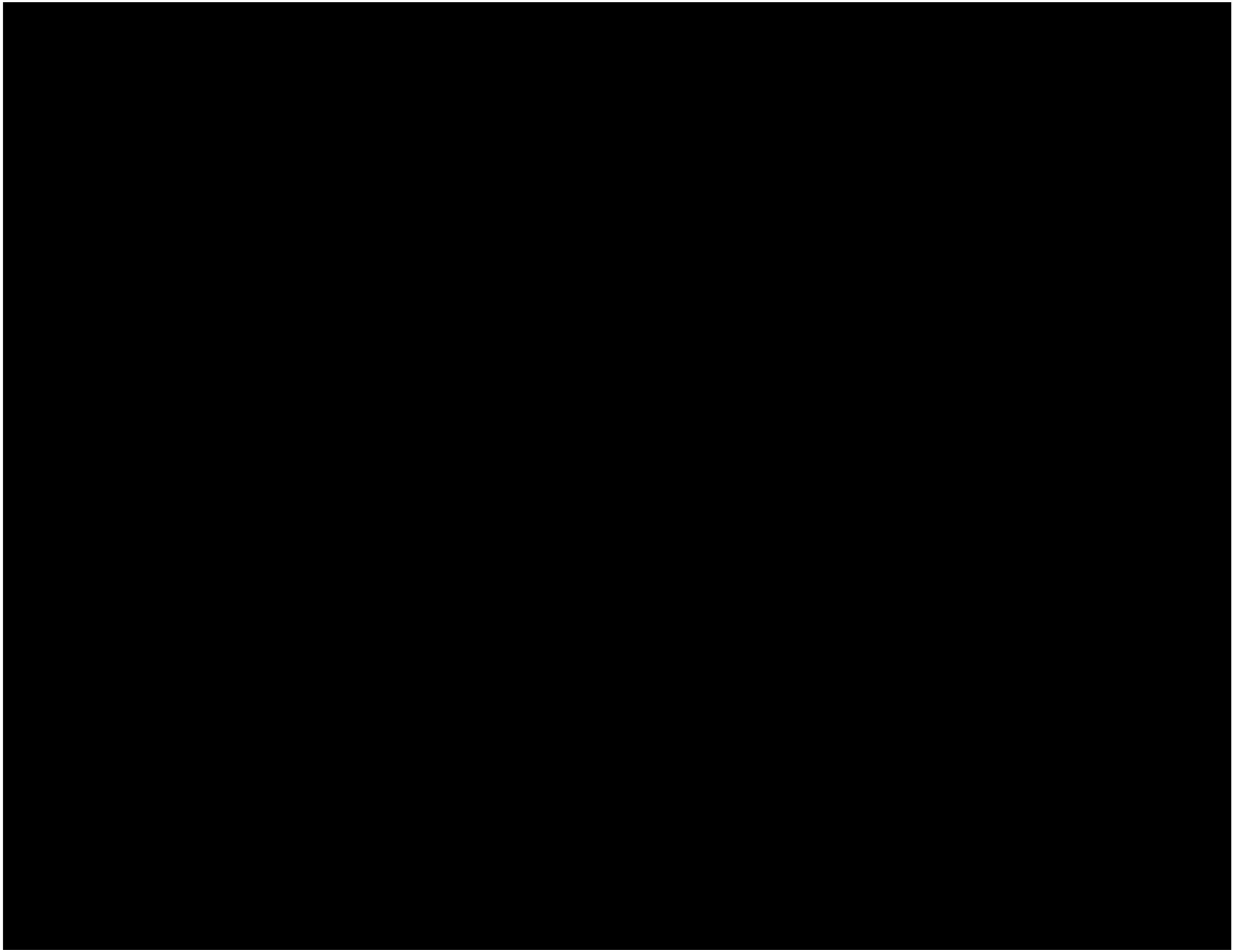


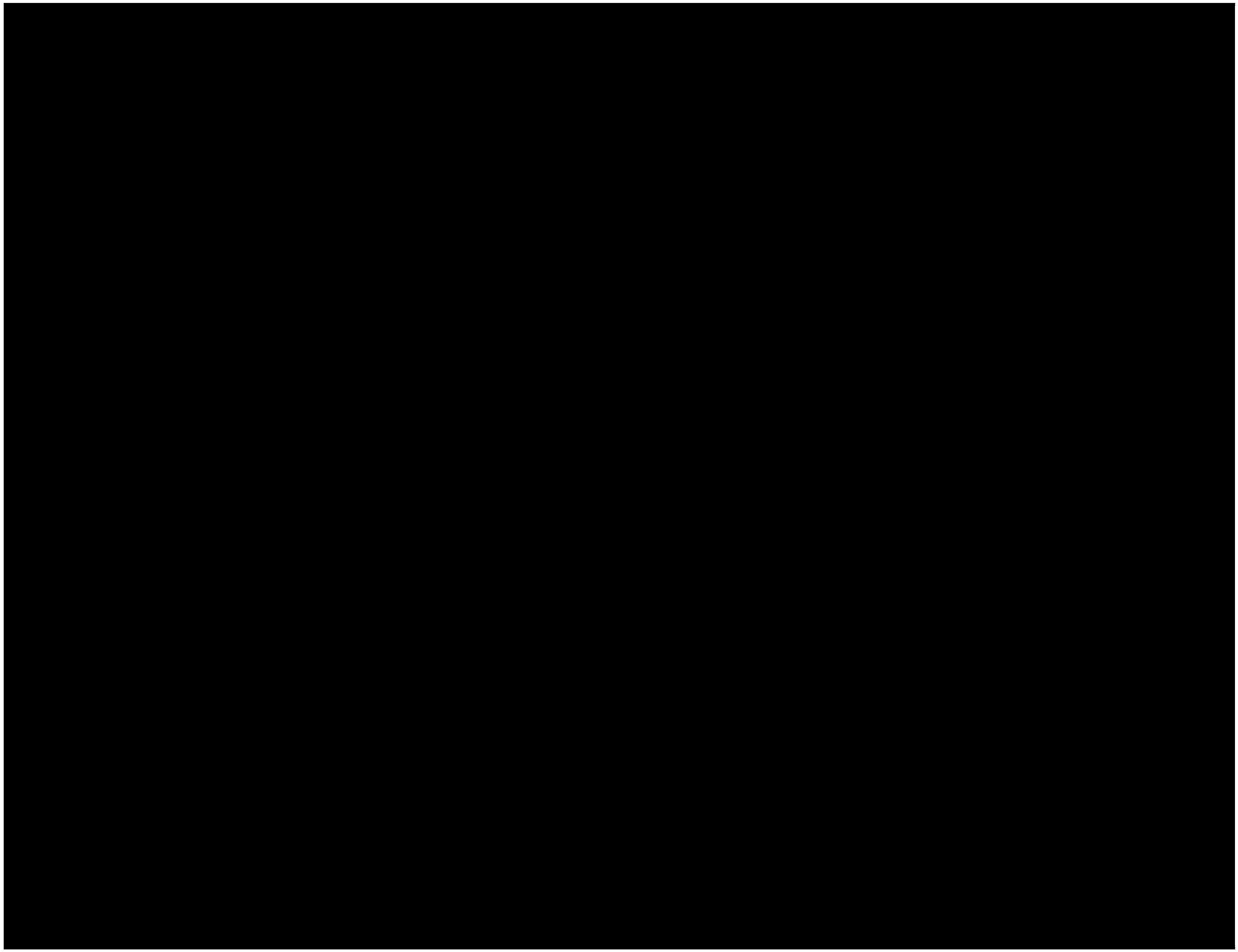


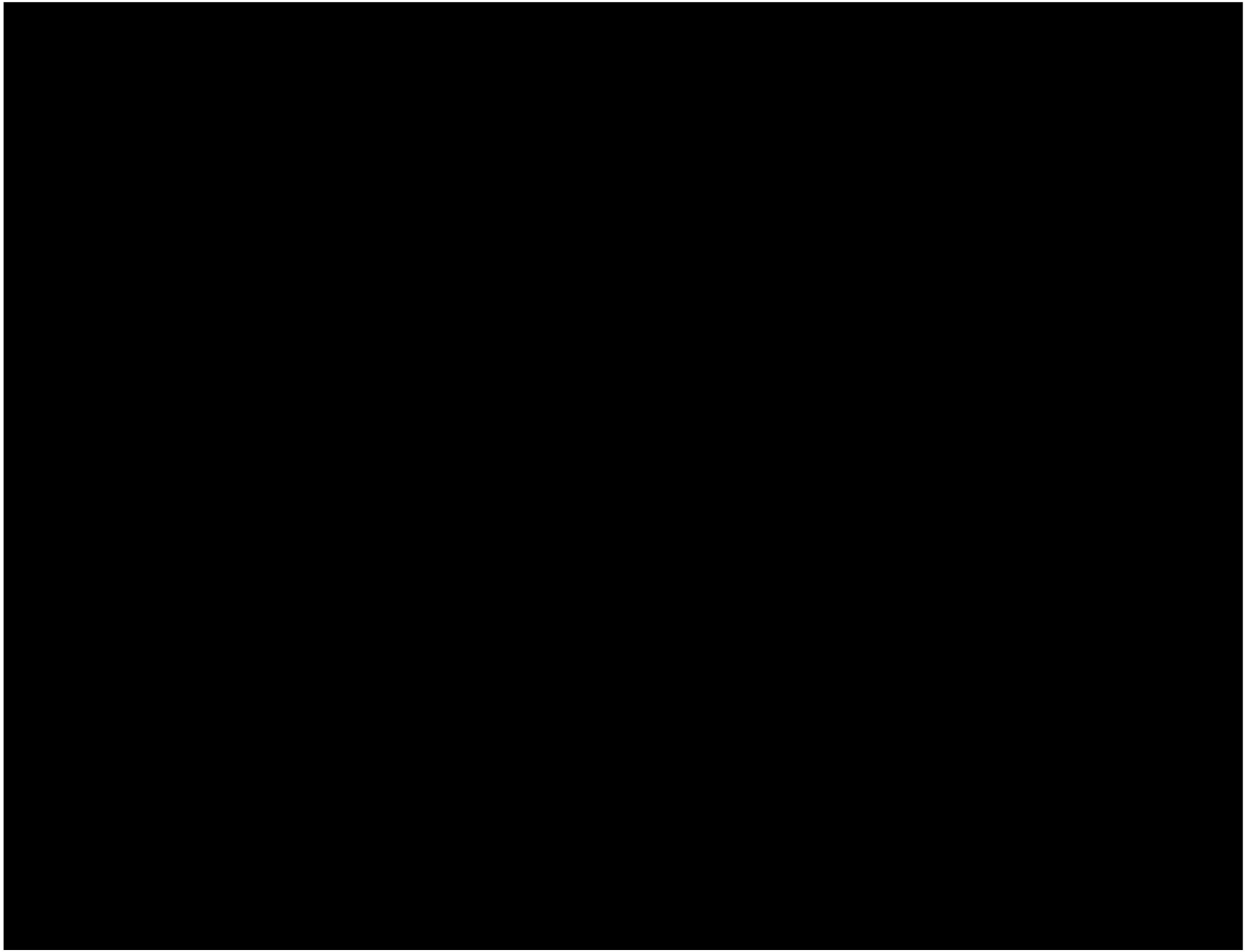


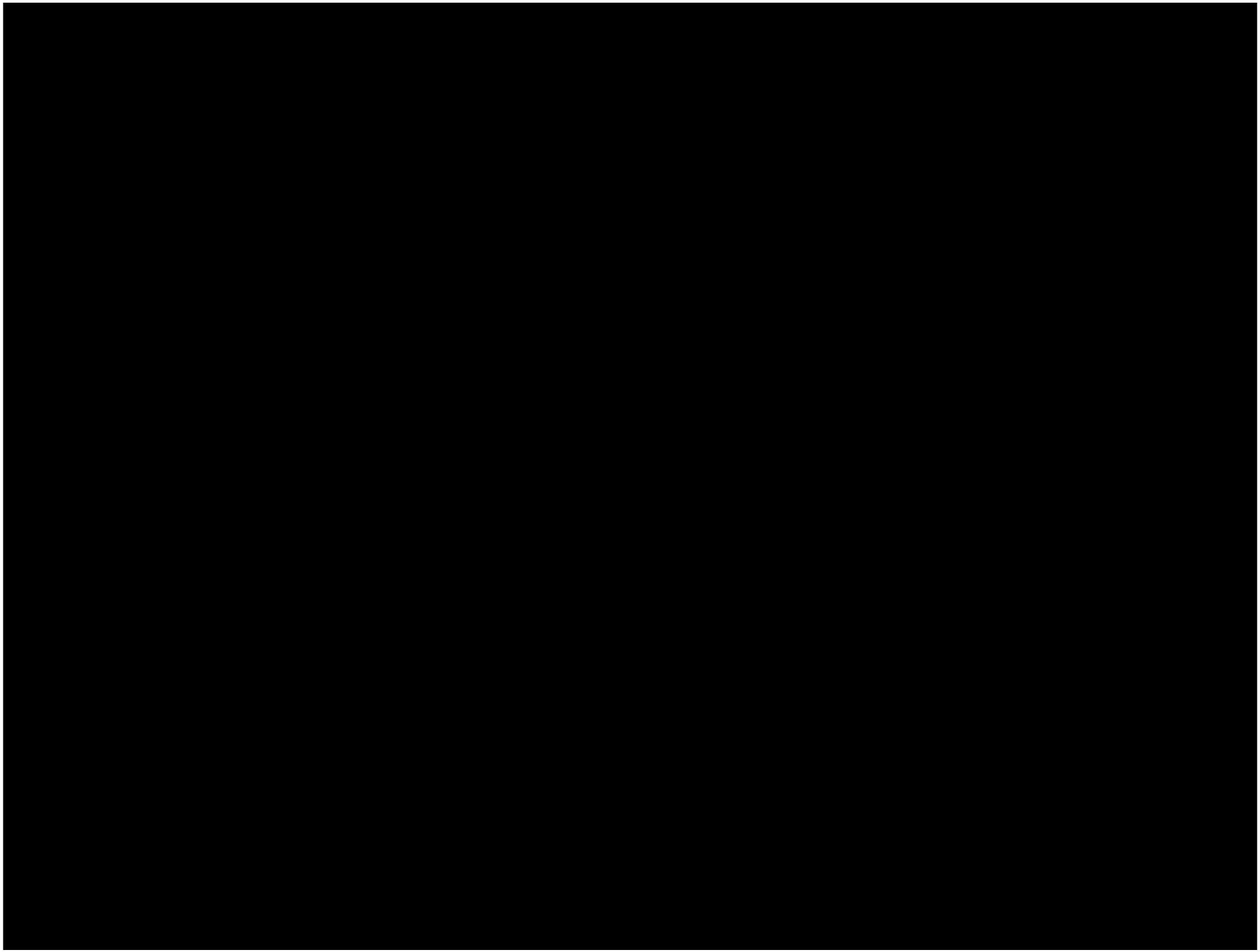


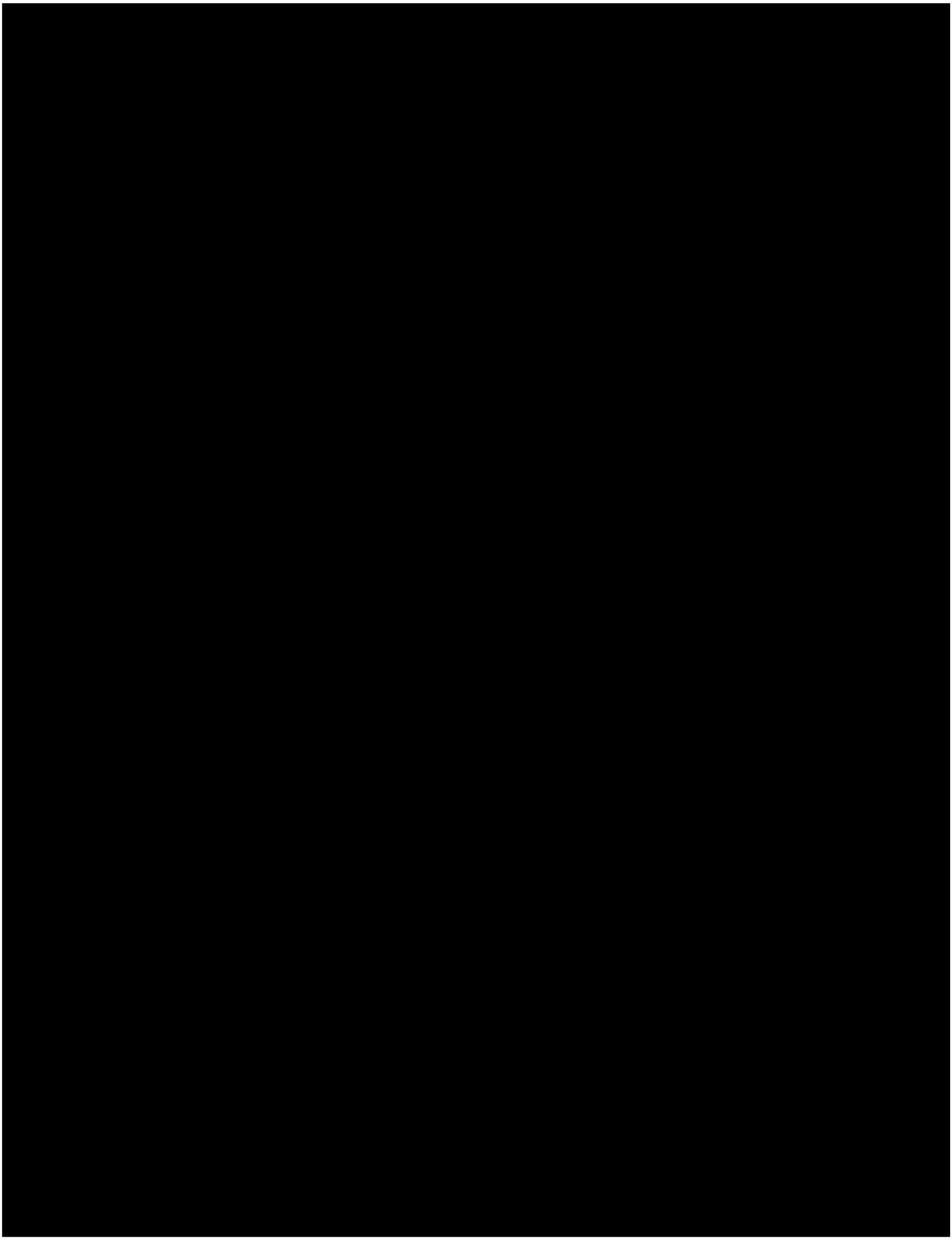


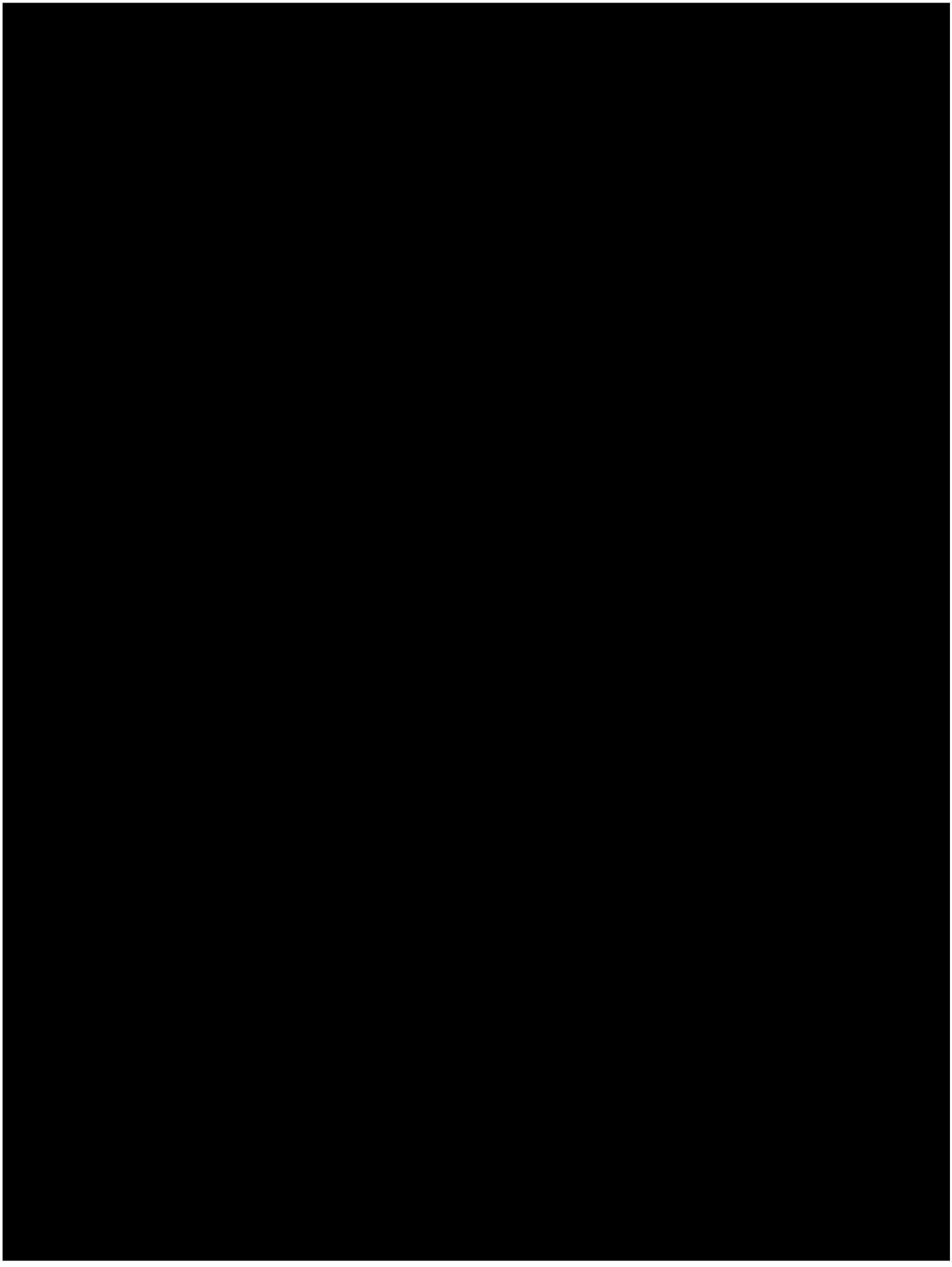


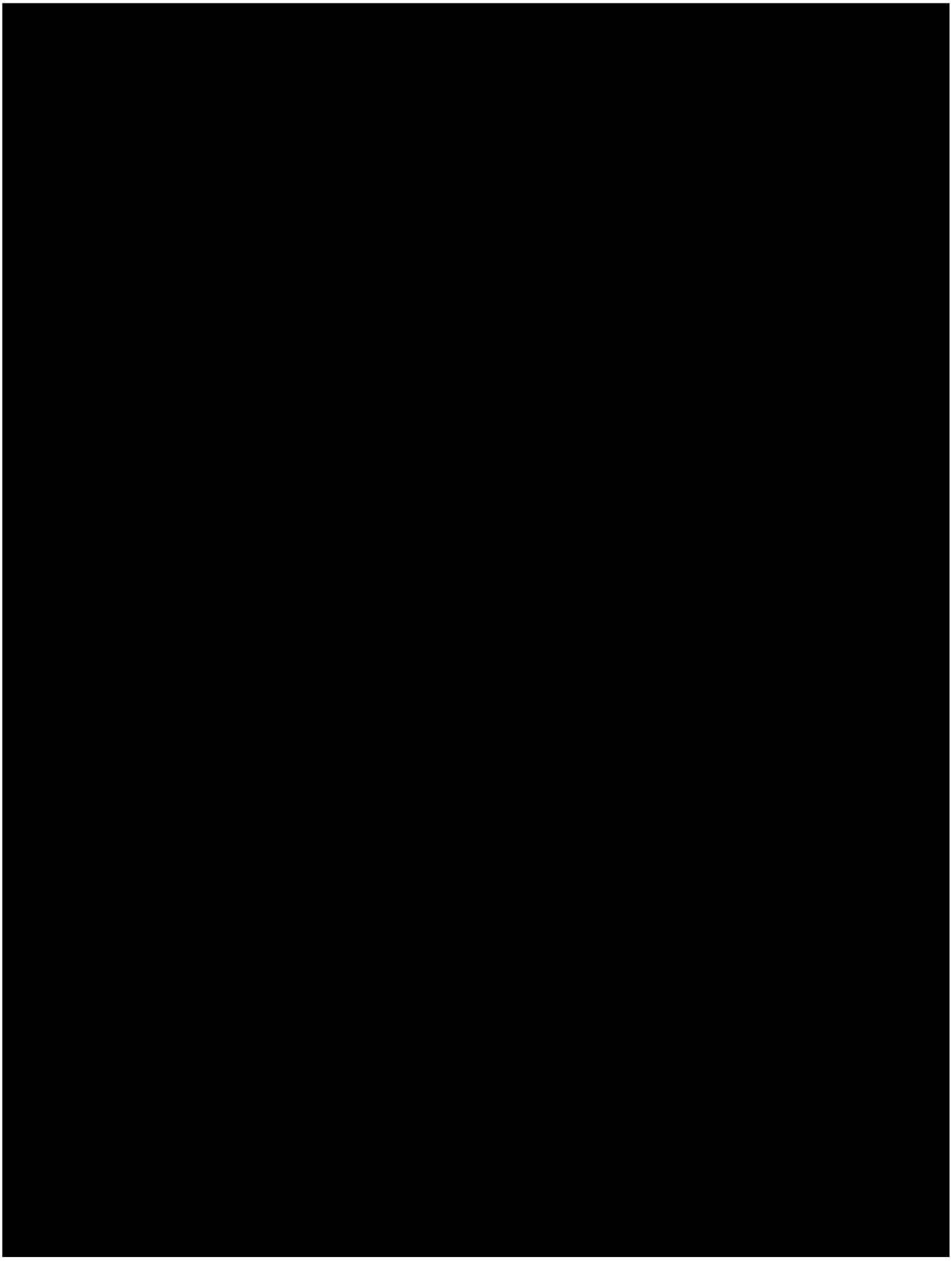


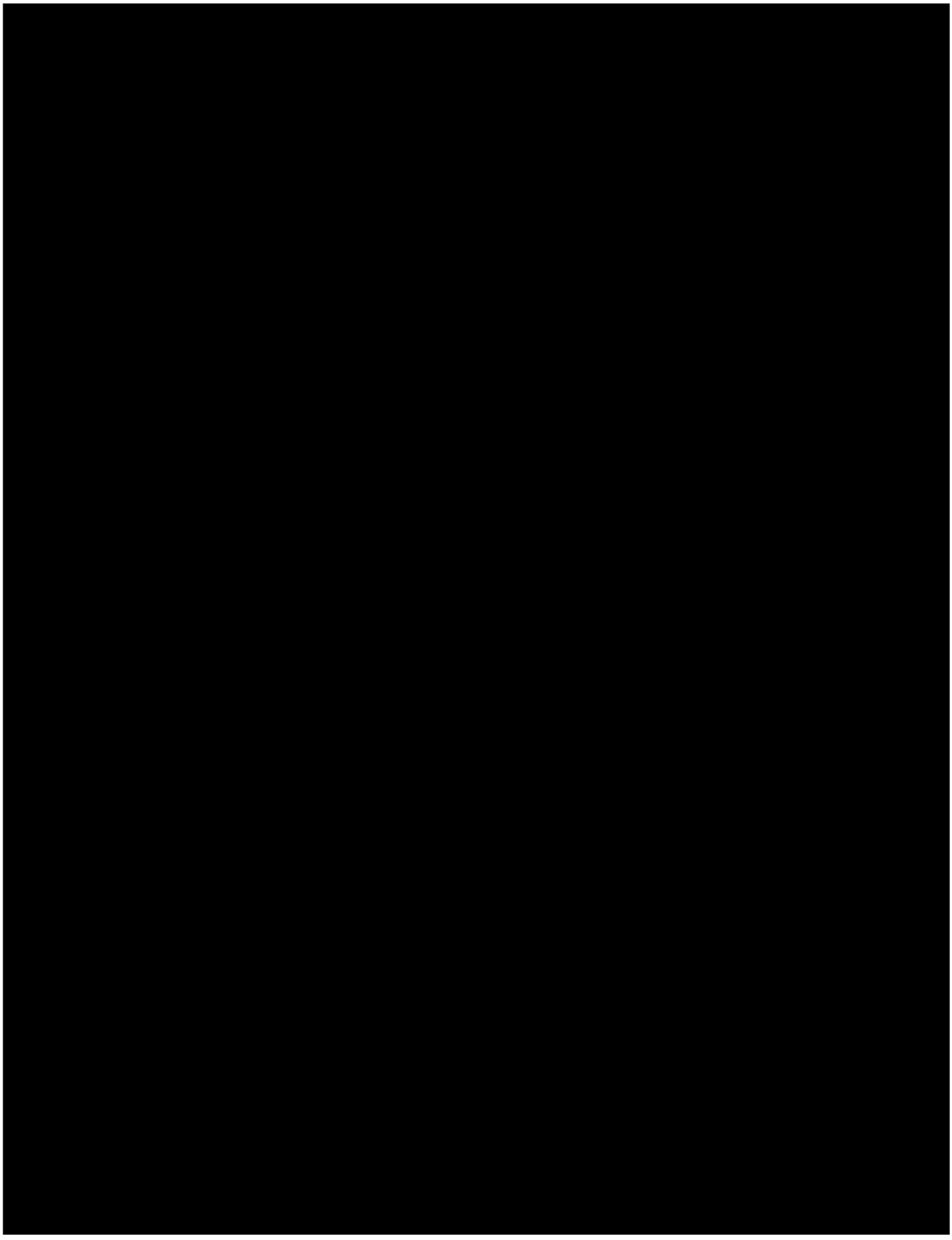












CALPINE®
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Corpus Christi Energy Center Procedure Manual

DOCUMENT: PLANT SPECIFIC WINTER READINESS PLAN

NUMBER: SP-98 Winter REVISION: 7

DocuSigned by: Rene Pena DS MA
286AGEB71BD7406...
PLANT MANAGER

11-23-2021
DATE

TABLE OF CONTENTS PAGE

1.0 PURPOSE

The purpose of this document is to describe the process to be used for preparing the Plant for reliable operations during the Winter Period by ensuring compliance with the Plant Specific Winter Readiness Plan (the "Plan"). The Plan is to be used in conjunction with the Winter Readiness Standard (the "Standard"), Plant Specific Winter Operations Procedure (the "Procedure"), the Winter Readiness Actions Timeline, checklists, worksheets, and Maximo PMs.

2.0 SCOPE

For the purpose of this procedure, the Winter Period is from November 15 through April 1. This Plan directs the management of the scope of work activities for staff to complete before cold weather arrives. This Winter Readiness Plan is not the same as the Procedure. The Plan is to provide guidance for *preparing* the plant to endure winter temperatures without unplanned or forced outages or derates. The Plant staff will implement the Procedure only when the ambient temperature is low enough to cause potential problems. The intent of the Plan is to identify reliability issues that are directly related to cold weather, not reliability issues in general.

3.0 DEFINITIONS

Critical Equipment: Plant equipment that, during cold weather events, has the potential to: initiate a unit trip, impact unit startup, initiate an automatic runback, adversely affect environmental controls that may cause an outage or derate, adversely affect the delivery of fuel or water supply to the unit, or create a safety hazard.

Winter Period: The period from November 15 through April 1.

4.0 RESPONSIBILITIES

Plant Manager

The Plant Manager is responsible for:

- Developing and revising (based on lessons learned) the Plant's Plan and the Procedure. The Plan and Procedure must address all recommendations in the Standard that are applicable to the Plant.
- Performing or delegating Winter Readiness Coordinator responsibilities.
- Approving Plant Specific Plans and Procedures and ensuring all identified winter readiness work is completed prior to its required winter completion date.
- Ensure all Plant specific planned winter readiness activities and identified preventive maintenance ("PM") and corrective maintenance are entered into Maximo. All winter planned and repair work is to be documented in Maximo using the program category

"Seasonal" and the task category "Winter".

- Routinely updating the RVP on the Plant's winter readiness status.
- Verifying the Plant's winter readiness and formally certifying that readiness to the RVP prior to winter.
- During cold weather operation, ensuring the Plant Procedure is implemented, and any issues identified are corrected in a timely manner to assure continued reliable winter operation.

Maintenance Manager

The Maintenance Manager is responsible for:

- Implementing the Plant Plan and revising the Plan as required based on lessons learned.
- Ensuring the Winter Readiness PMs and other activities are in Maximo and implemented in accordance with the timeline included in the Plant's Plan and documented in Maximo (using the category "Seasonal" and the task category "Winter").
- Ensuring initial adequate stock of any consumables and supplies required to be on hand prior to any significant cold weather event (list included in the Plan) and re-ordering such stock of consumables and supplies when appropriate.
- During Winter Period, timely identifying and addressing any equipment deficiencies that could impact reliable operation during cold weather and properly documenting all repairs in Maximo.

Operations Manager

The Operations Manager is responsible for:

- Implementing the Plant Procedure and revising the Procedure as advisable based on lessons learned.
- Reviewing the Plant Operations Procedure before each Winter Period (October) to ensure the operating procedures, checklists, and instructions are current and include any new equipment added to the plant configuration since the previous Winter Period. Include in the review, Calpine fleet lesson learned, NERC lessons learned, and general industrial best practices that may have become known since last Winter Period.
- Reviewing the ongoing winter operation activities implemented during cold weather events, including activities identified in the rounds sheets and other checklists, in the Plant Procedure.

- Verifying that the Plant communications system is operational and that backup communications are in place.

Winter Readiness Coordinator

A Winter Readiness Coordinator shall be appointed by the Plant Manager. The Winter Readiness Coordinators are responsible for communicating and tracking activities needed to achieve sustained reliability and availability during extreme weather events and for routinely reporting to the Plant Manager the status of the Plant's winter readiness preparations. The Plant Winter Readiness Coordinator supports the Operations and Maintenance Managers as required in performing their responsibilities as outlined above.

Specific responsibilities include:

- Chairing scheduled winter readiness meetings at intervals appropriate to the Plant.
- Tracking and reporting status of the Plant's winter readiness preparations.
- Procuring and positioning winter readiness consumables and supplies required to be on hand prior to any significant cold weather event (list included in the Plant Plan).

5.0 THE PLAN

In accordance with the Standard, the Plant has developed a Plan which includes its performance and documentation of the following activities, whenever applicable:

1. Minimum Plant Design Operating Temperature. The minimum design temperature for Plant operations is [redacted]

   The Plant reviews any Plant modifications made in the previous year to verify that the modifications have not impacted the minimum plant design operating temperature.

   This annual review is scheduled on PM # 117511 and the results are documented in the Plant's SharePoint or Maximo.

2. Review of Lessons Learned. The Plant reviews equipment freezing issues experienced over the previous year to determine lessons learned and incorporates lessons learned into the Plant Plan to avoid any reoccurrence.

   This review is scheduled in PM #117513 and any identified action items are placed in Maximo work orders and identified with program code "Season" and Task Code "Winter" and reviewed during annual training with Plant staff. Any lessons learned may also be documented in the Plant's SharePoint.

3. Review Critical Equipment List. A list of Plant Critical Equipment that may be impacted by cold weather is attached as Attachment 1 to this Plan (Critical Instrument List). PM #110736 triggers review of equipment list.

4. Inspection and Testing of Heat Trace Panels and Heat Tracing for Critical Equipment Instruments. The type of heat tracing used at the Plant is the constant wattage type. Heat tracing is used to protect instruments and other vulnerable equipment from freezing. PM # 110736 is in Maximo for monthly testing from November 1 to March 31. Any issues found during these PM checks are documented as follow up work orders in Maximo and identified with program code "Season" and Task Code "Winter." Attached to the Plan is Attachment 2 (Heat Trace List), identifying the circuits, testing method, ambient temperature when tested and testing results.

5. Perform Instrument Air System Maintenance. The Instrument Air System is critical to the operation of the Plant. Instrument Air System components are given high priority when malfunctions occur. To maintain the system integrity, moisture is removed from the system by automatic blowdown of the system or during extreme cold conditions, low points are blown down manually.

   The designed dewpoint is -20 degrees to -70 degrees and the dewpoint is monitored by Operations personnel and an annual walk down of the system is performed as part of the Procedure. An annual review of the Instrument Air system maintenance is performed on PM #1033991 prior to winter.

6. Review Corrective Maintenance Work Orders. As part of the Winter Period preparation, a review of open Corrective Maintenance Work Orders having program code "Seasonal", and Task Code "Winter" is conducted to determine their potential impact on winter readiness and shall be integrated into the Plant's work week.

   The review is documented as part of the Plan on PM #115514.

7. Perform Plant Insulation Walkdown. Perform a Plant walk down of the Critical Equipment's insulation and lagging and identify areas of insulation that should be considered for repair prior to winter operation. PM #103399 is in place to generate a work order for this review. Any corrective work is documented in Maximo by corrective work orders created during the Winter Readiness walkdown.

8. Winter Readiness Consumables and Supplies. A list of consumables and supplies kept in store for freeze protection is contained in Attachment 3 (Winter Readiness Consumables and Supplies). An inventory check is performed by Operations personnel (PM #99554.

9. Test Portable Heaters and Heat Lamps. Portable space heaters used for freeze protection are kept in a designated storage area for winter supplies. An operational test is performed on these portable heaters annually by Operations personnel (PM #110735) of the Plan.

on these portable heaters annually by Operations personnel (PM #110735) of the Plan.

10. Test Permanent Building Space Heaters. An annual operational/functional check of all space heaters permanently installed in Plant buildings is conducted annually to ensure proper operations under PM #117512 A copy of the list of permanent building space heaters and their location is attached in Attachment 4 (Permanent Building Space Heaters).

11. Check Glycol Concentration. Not applicable. The Plant does not have any closed loop systems.

12. Space Heaters on Critical Instrument Breakers. To ensure the protection of all critical equipment circuit breakers, PM #110737 is performed annually to inspect and function test space heaters in all critical equipment breakers that are so equipped. A list of breakers and inspection criteria is attached in Attachment 5 (Space Heater Check for Critical Equipment Breakers) of this Plant.

13. Operation Check of Critical Instruments with Instrument Box Heaters. Instrument box heaters (O'Brien, Hoffman, etc) are checked to verify correct operation. Attachment 6 (List of Instruments with Box Heaters)

14. Installation and Disassembly of Temporary Wind Breaks / Enclosures. Windbreaks and temporary heaters are installed annually to protect critical equipment from freezing. PM #109947 is performed each year to erect wind breaks/enclosures. A map of temporary windbreak locations around the Plant is attached in Attachment 7 (Temporary Windbreaks).

15. Draining Equipment. PM # 99535 and 99536 are used to instituted draining of equipment. Attachment 8 (Draining Equipment) shows the equipment which is drained.

16. Fuel Oil Handling Equipment. Not applicable. The Plant does not have any fuel oil handling equipment.

17. Icing Prevention Equipment. Not applicable. The Plant does not have any icing prevention equipment.

18. Additional Preparations for Susceptible Plants. Not applicable. The Plant is not located in a winter storm susceptible area.

19. Annual Plan Review. This Plan will be reviewed annually by Plant management. PM#117515 is in place to ensure the annual reviews are performed.

20. Personnel/Operator Training. Winter readiness refresher training is completed annually as part of the Plant's Procedure prior to the Winter Period. The training will include any applicable Plant modifications, past winter lesson's learned, alternative instrumentation

should the Plant's primary instrumentation becomes unreliable.

Personnel and Operator Training is documented as part of the Plan on PM #113485 and attendance by Plant personnel should be documented in writing in Attachment 9 (Personnel/Operator Training) and retained.

21. Winter Readiness Action Timeline. Attachment 10 (Winter Readiness Action Timeline) of this Plan contains a timeline for winter readiness actions and milestones. PM #117516 triggers review of Winter Readiness Action Timeline.

6.0 The Procedure

In accordance with the Standard, the Plant implements the Procedure when

1. Operational Checklist During Freezing Weather. When outside ambient air temperature at the Plant is predicted to decrease or decreases to [redacted] ("Winter Weather Conditions") the Plant Operations Team implements the Procedure which is stored in the Plant SharePoint, including completing the Freezing Weather Actions and Logsheets.

7.0 Pre-Winter Plant Status Reviews and Readiness Certification

Prior to the onset of the Winter Period each Plant Manager verifies winter readiness and formally communicates site status to the RVP (see example Attachment 11 (Corpus Christi Winter Readiness Certification). RVPs review regional winter readiness status and certify status to the EVP Operations.

8.0 REFERENCES

- CSN-1021 (Winter Readiness Standard)
- CPN-714 (Records management)
- CSN-101 (WORK MANAGEMENT PROGRAM)
- Management OF Design Change Procedure

SUPPORT DOCUMENTS

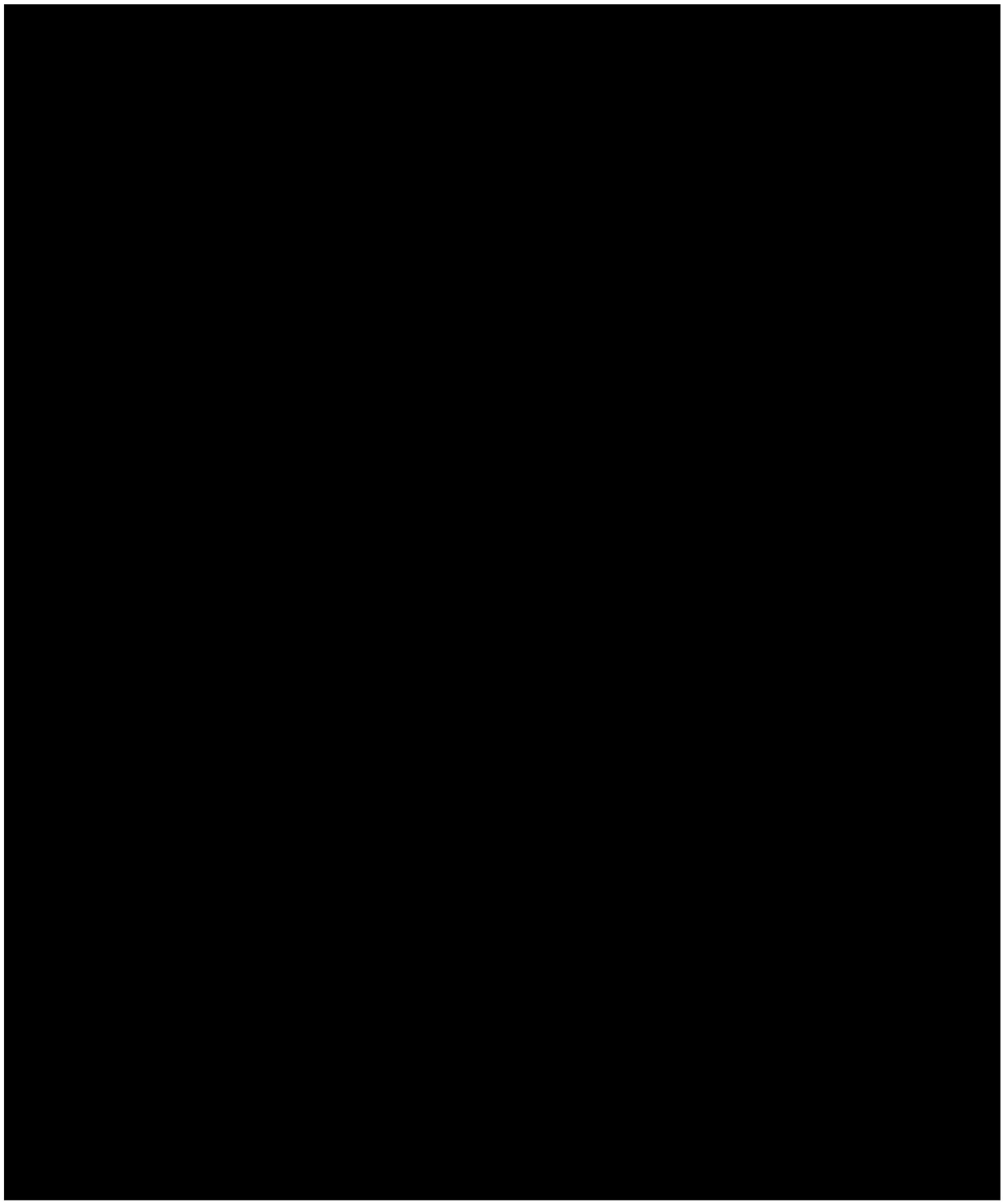
Attachment 1: Critical Instrument List

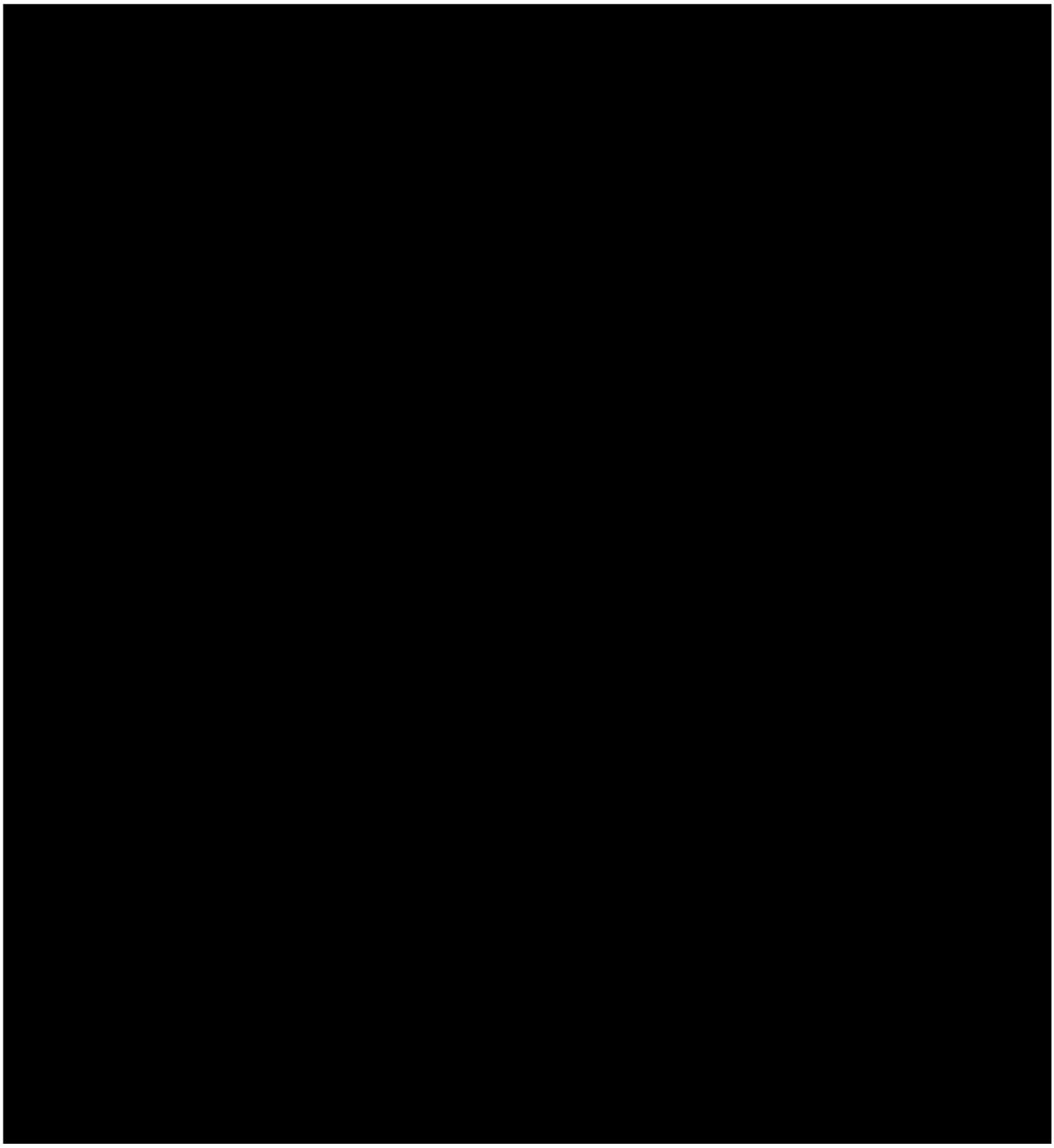
Attachment 2: Heat Tracing List

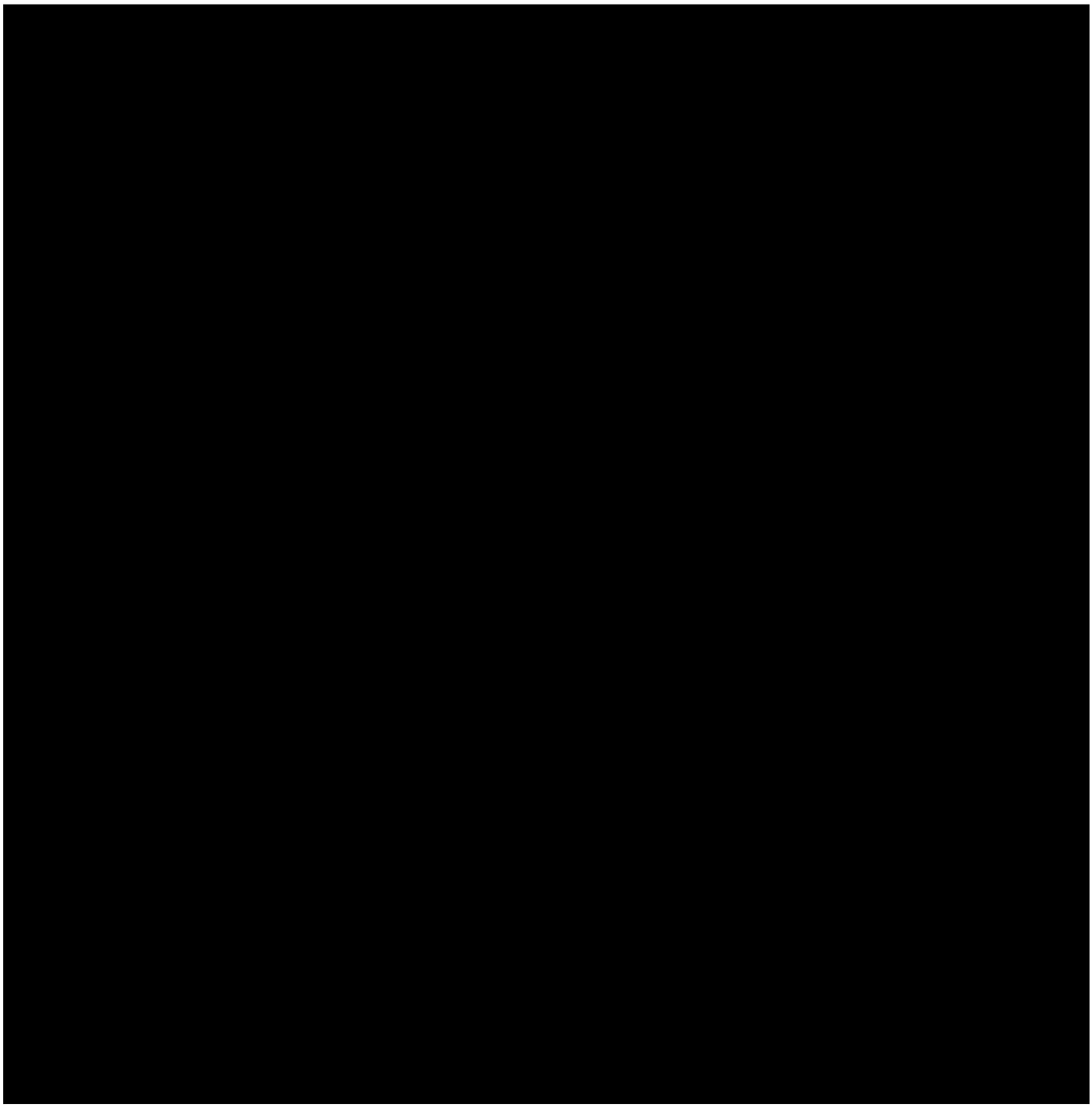
Attachment 3: Winter Readiness Consumables and Supplies

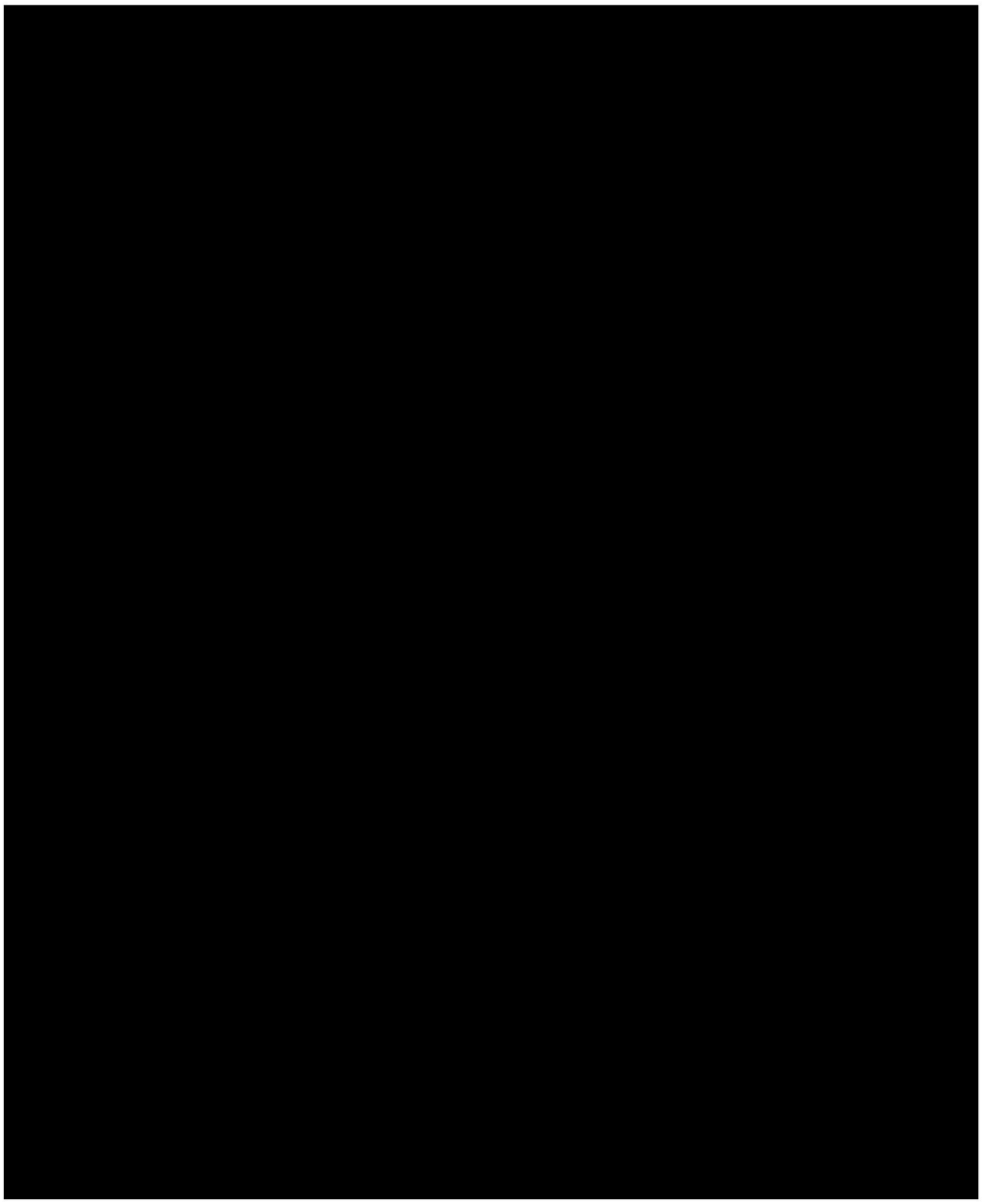
Attachment 4: Permanent Building Space Heaters

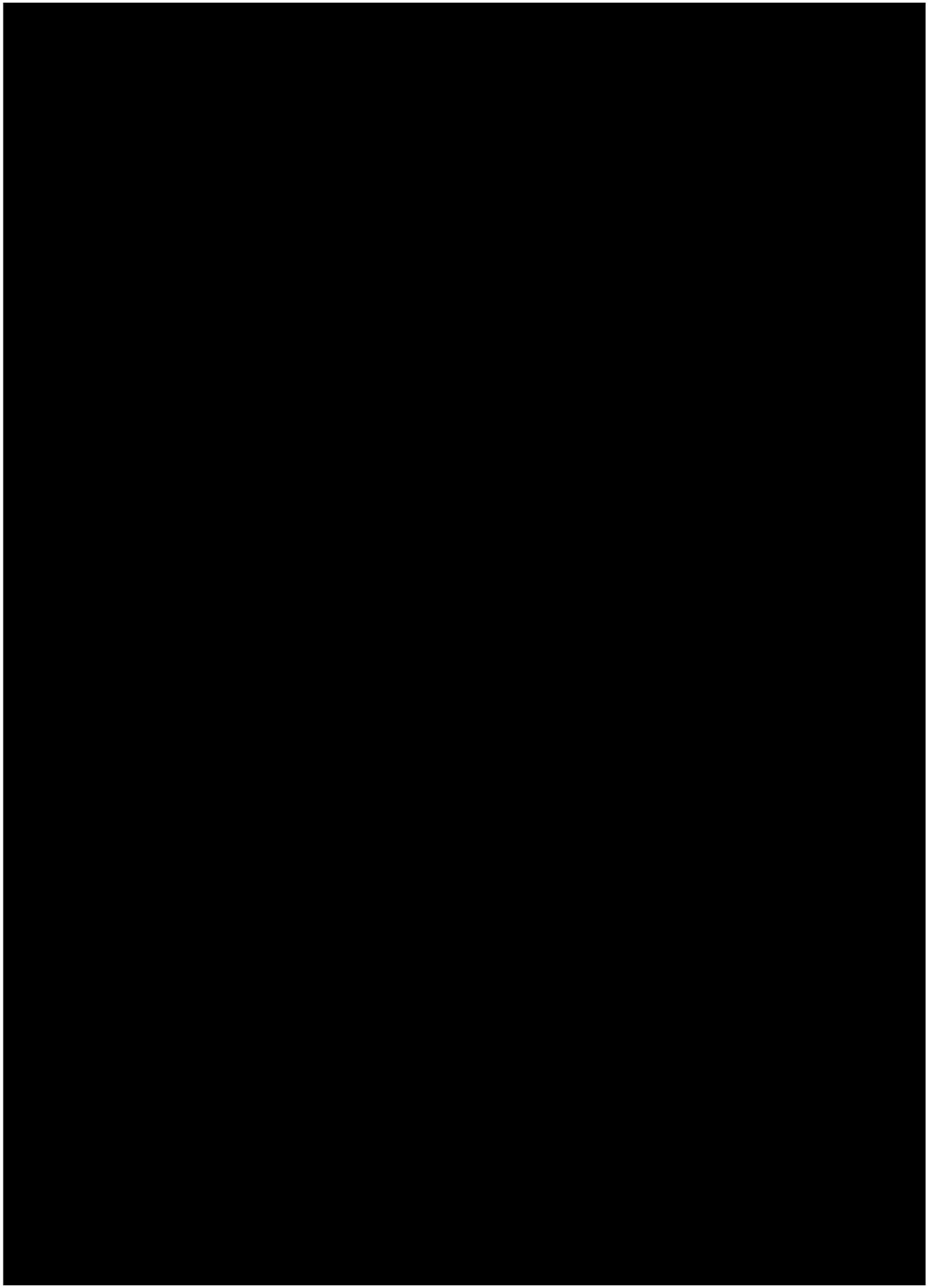
Attachment 1: Critical Instrument List

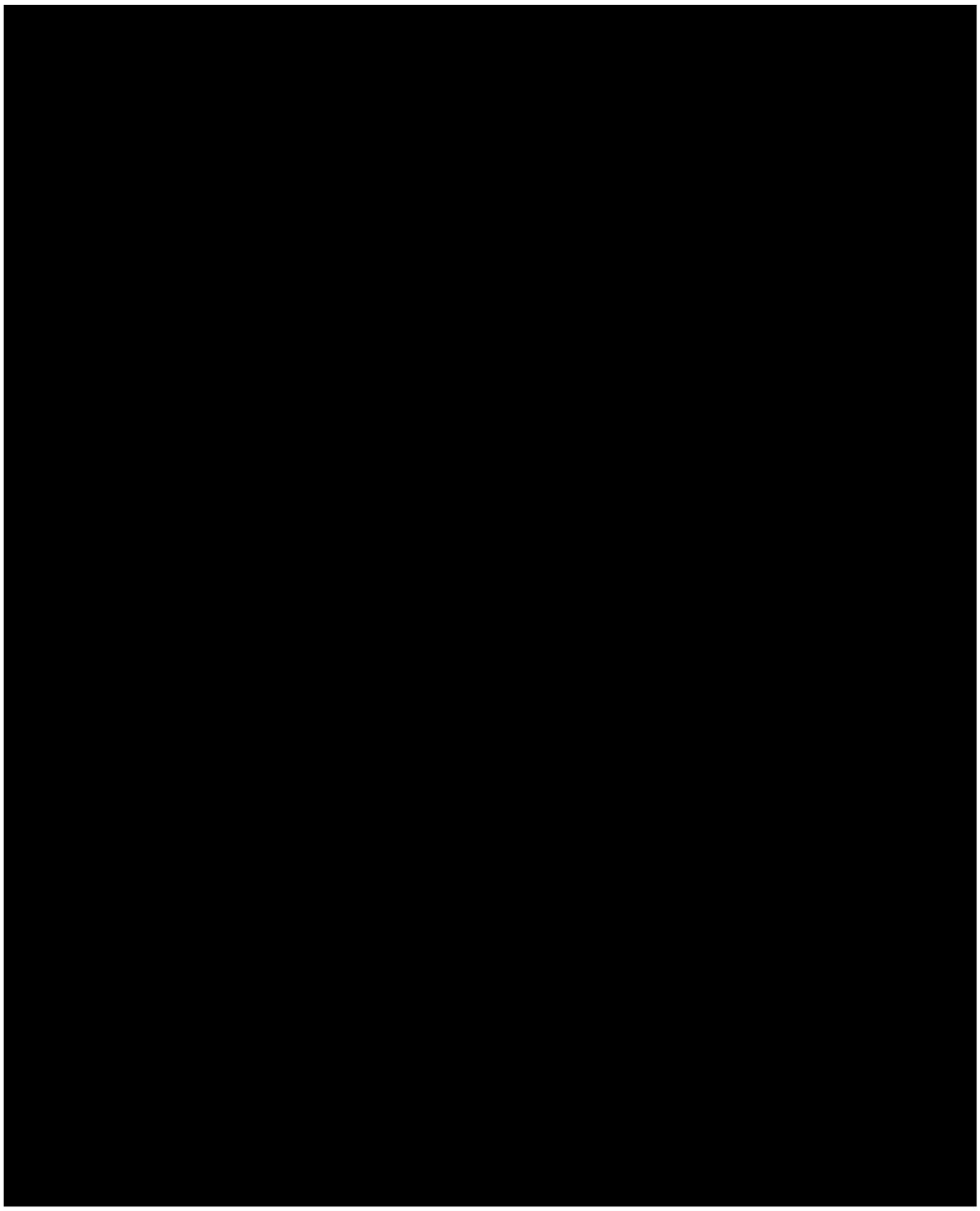












Attachment 3: Winter Readiness and Consumables

Attachment 3: Winter Readiness and Consumables

Evaluator: Jose-Michael Garcia **Date:** 11/19/21

Sheet No. 1 of 1		Date: 11/19/21		
Performed by:			Department	Operations

Minimum Quantity	Item Description	Quantity on Hand	Order Required	Location
40	S-20605 Triple Outlet Extension Cord -100	40	NO	Warehouse
72	S-20555 Halogen Incandescent Light Bulbs- 43 Watts	72	NO	
20	13R101 Electric Heating Cable, 6FT	20	NO	
30	13R102 Electric Heating Cable, 12FT	30	NO	
30	39AM81 Incandescent Hand Lamp	30	NO	
5	8N088 Adjustable Outdoor Torch Kit	5	NO	
30	Steel Propane tank 14.1oz	30	NO	
10	35LV02 Pencil Torch Head, Propane	10	NO	
10	2FTN5 Carbon Monoxide Alarm with 85 dB	10	NO	
10	453U90 Portable Oil & Kerosene Heater	10	NO	
10	Portable electric space heaters	10	NO	
5	Tarps Large 20x30	5	NO	
5	Tarps 15x20	5	NO	

PM# 99554
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SAT

Closed Comp

Attachment 4: Permanent Building Space Heaters

Date:

CCEC A/C and Heater Units

Location	A/C	Heater	Amps	Comments
Mtce shop				
Warehouse				
Lab		none		
Gas yard		none		
Peecc 1		none		
Peecc 2		none		
WTB MCC		none		
STG exciter bldg		none		
STG L/O deluge bldg		none		
MSU 1 deluge bldg		none		
MSU 2 deluge bldg		none		
MSU 3 deluge bldg		none		
4160 bldg		none		
SUS 1		none		
SUS 2		none		
Exciter 1/LCI		none		
Exciter 2		none		
HRSG commons		none		
HRSG 1 DCS bldg		none		
HRSG 2 DCS bldg		none		
Control Room				
Administration				
MCR MCC		none		
WTB				
EDG control compartment		none		

Attachment 5: Space Heater Check for Critical Equipment Breakers

CCEC Breaker heater circuits

Date: _____ Revised 11/19/2021

		Amps on heater circuit	Completed Y/N	Heater working Y/N	Work order written Y/N	
	AREA					
1	[redacted]					
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						

19			[redacted]		[redacted]		[redacted]				
20											
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36											
37											

Attachment 6: Instrument Box Heater Check

CCEC Breaker heater circuits

Date: _____ Revised 11/19/2021

		Amps on heater circuit	Completed Y/N	Heater working Y/N	Work order written Y/N	
	[redacted]					
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						

19			[redacted]		[redacted]		[redacted]				
20											
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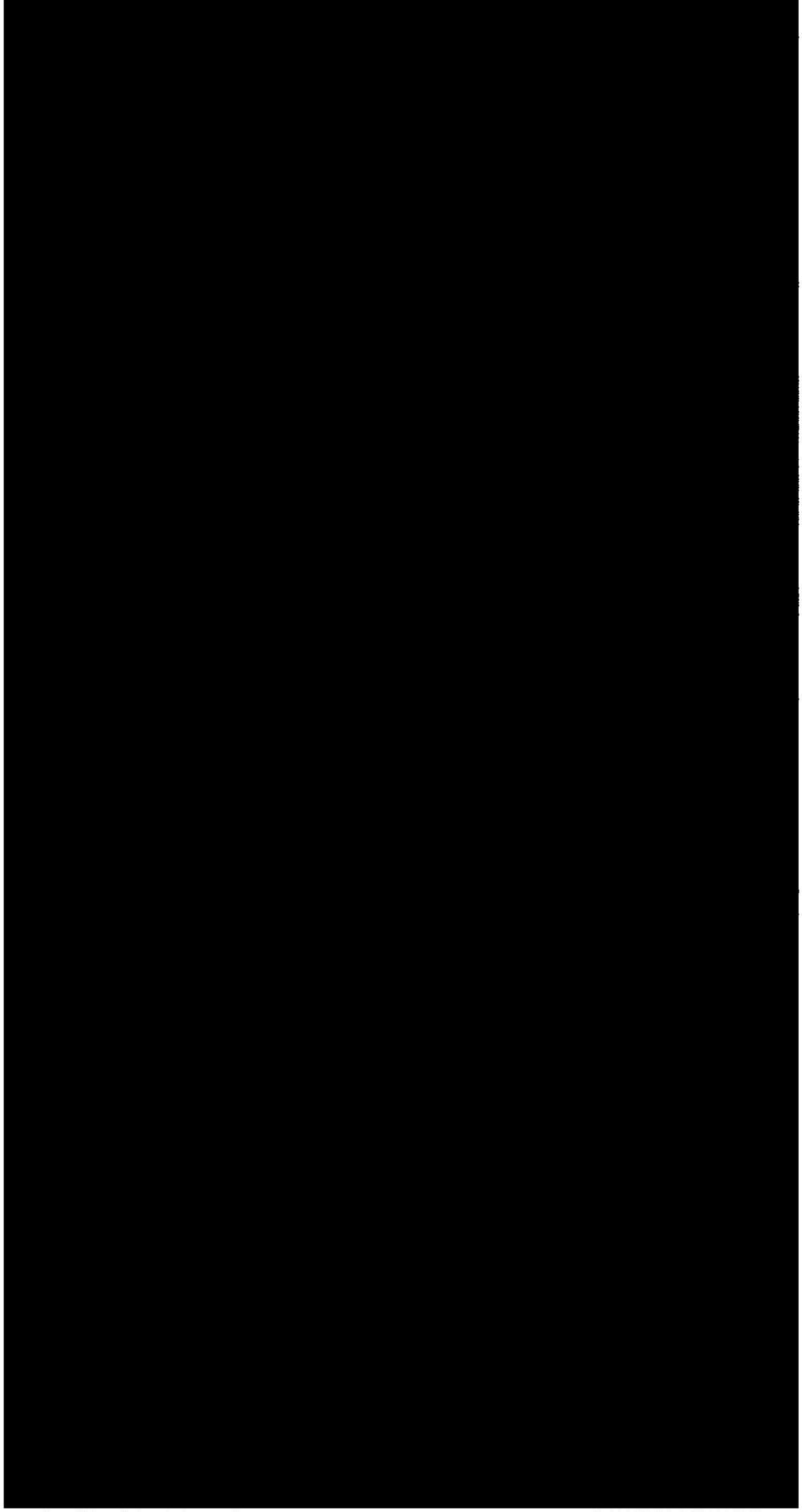
Attachment 7: Temporary Windbreaks



Attachment 8: Draining Equipment

CCEC Draining Equipment

Date: _____ Revised 11/30/2021

			Completed Y/N			
	[redacted]	[redacted]		[redacted]		
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						

19		[redacted]									
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Attachment 9: Personnel/Operator Training

Training Rosters and Training Materialsshould be retained by Plant for 5 years.

Employee Name	Date Training Complete	Employee Signature	Comments

Attachment 10: Winter Readiness Action Timeline

Key Milestone	Recommended Completion	Comments
Initial Annual Pre-Winter Readiness Meeting	May–July	Meeting to review: Plant Winter Readiness Plan, Open Corrective "Winter" Work Orders and PMs
Final Workscope and Actions Required	August–September	Finalized workscope approved by Plant Manager to implement prior to winter
Operations Procedures Reviewed and Updated as Required	October	Site specific Winter Operations Procedures reviewed and updated based on lessons learned and new equipment added
Winter Readiness Training	November	Complete training for plant personnel involved with Winter Preparedness and Winter Operations
Winter Readiness Certification by the Plant Manager	November	Provided to RVP. Reference Attachment 17
Winter Readiness Activities Completed	December 1	This date may vary for specific plants based on location
Post – Winter Meeting	March–April	Review specific plant lessons learned from the past winter.

Attachment 11: Corpus Christi Winter Readiness Certification

To: (Regional VP, Operations Name)

From: (Plant/General Manager Name)

Subject: Winter Readiness Certification

(Plant Name) has reviewed the requirements of the Plant Specific Plans and Procedures related to Winter Readiness preparation and Winter Operation, and by copy of this letter is ready to certify (Plant Name) winter readiness. [Plant] has completed review of plant winter readiness and implemented preventive and corrective actions required to provide reasonable assurance of operation during foreseeable winter conditions at the site. In-progress items relating to winter operation are summarized below.

A. The basis for our certification is as follows:

1. Significant outcomes of system reviews
2. Status of preventive maintenance affecting Winter Readiness
3. Status of corrective maintenance affecting Winter Readiness
6. Status of modifications/projects affecting Winter Readiness
7. Status of Operations Winter Readiness Procedures/Checklists
8. Status of Winter Readiness supplies
9. Other

B. Winter readiness items not completed

1. Reason
2. Open Actions Items
3. Owner & Due Date

CALPINE®
NYSE CPN

Corpus Christi Energy Center Procedure Manual

DOCUMENT: PLANT SPECIFIC OPERATIONS PROCEDURE

NUMBER: SP-98 Winter REVISION: 0

DocuSigned by: Rene Pena DS MA
286ACFB71BD7406...
PLANT MANAGER

11-23-2021
DATE

TABLE OF CONTENTS PAGE

1.0 PURPOSE AND SCOPE

Provide instructions for protecting equipment during extreme cold weather season (November 1st to March 15th of the following year) when outside air temperature is predicted to decrease or decreases to the following conditionswhen outside ambient air temperature decreases to **ANY** of the following conditions:

[redacted]

Provide instructions for Restoration from Freezing Weathe

2.0 DEFINITIONS

DCS: digital control system

EHS: Environmental Health and Safety

ERCOT ISO: Electrical Reliability Council of Texas Independent System Operator

MCC: motor control centers

TCEQ: Texas Commission of Environment Quality

3.0 RESPONSIBILITIES

1. The Plant Manager SHALL implement this procedure prior to or upon a National Weather Service or company meteorologist prediction of falling temperatures within the limits described in the plan.

2. The temperature indication for determining the outside air temperature to decide when to enter this procedure or change to a different condition SHALL be used in following order:

    - DCS air temperature.
    - Nearest National Weather Service weather observation location (typically the nearest airport).

3. Failure to maintain the Battery Room temperature [redacted] MAY result in degrading the discharge capability of the battery should a loss of offsite power occur.

4. Failure to maintain either PEECC room temperature [redacted] MAY result in

degrading the discharge capability of the PEECC battery should a loss of offsite power occur.

5. Failure to maintain the LCI Compartment room temperature greater than 40°F MAY result in damage to the LCI cooling water system.

6. Failure to maintain the caustic system temperature [redacted] will result in the freezing of the caustic and could potentially lead to a water plant shutdown.

7. IF an instrument is suspected of freezing, THEN the instrument indication SHALL be monitored to verify reliability.

8. IF an instrument indication is unreliable, THEN an alternate method of monitoring the affected process variable SHOULD be established.

9. IF an instrument freezes, THEN actions SHALL be taken to return the instrument to service.

10. Out-of-Service equipment SHALL be evaluated for cold weather preparation (e.g., isolation/draining of tanks, isolation/draining non-essential equipment, installing temporary shelters, installing temporary heaters, and installing temporary insulation).

11. Follow Electrical Safety Precautions of EHS-17 (Electrical Safety) when accessing Heater Controls. Open, energized circuits exist inside the heater control enclosures.

12. The blank on the right side of certain steps of the checklist are for tracking completion of important activities. The blank can be initialed by either the person performing the procedure step or the person responsible for ensuring the step is completed as directed (e.g., the CRO can initial for the Yard Watch performed actions, etc...).

13. The cooling tower fans will be operated either in Fast, Slow or Off depending on weather conditions and heat load on the cooling tower.

4.0 REFERENCES

CPN-714 (Records Management)

CSN-101 (Work Management Program)

Management of Design Change

5.0 RECORDS

Any records generated as a result of this process shall be filed and retained in accordance with CPN-714 (Records Management). Processes and procedures referenced in this document shall prescribe any specific records requirements within those documents.

6.0 SUPPORT DOCUMENTS

- Logsheet 1: Room Temperature Inspection Logsheet

- Logsheet 2: Freeze Protection Panel Inspection Logsheet
- Logsheet 3: Instrument Enclosure Inspection Logsheet