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Also Present: Michael Parker, Esquire


## RROCEEDINGS OF DECEMBER 4, 2018 hearing officer slater: Today is Monday,

 December 3, 2018. It is the time and date set for the case of United States Steel Corporation versus Allegheny County Health Department. At this point, I would like counsel for each party to please identify themselves. Let's start with the Health Department. MR. WILLIS: Jason Willis for the HealthDepartment.
MR. PARKER: Michael Parker.
HEARING OFFICER SLATER: And for U.S. Steel? MR. DAUSCH: Mark Dausch for U.S. Steel.
MR. WINEK: Michael Winek for U.S. Steel.
MR. HACKER: Dave Hacker for U.S. Steel.
hearing ofeicer slater: All right. Will any
witnesses in this case please raise -- or any witness
who is testifying today, please raise their right hand to be sworn in?
(All potential witnesses were duly sworn by the court reporter.)

HEARING OFFICER SLATER: Mr. Willis, you may proceed with your opening statement.

MR. WILLIS: Thank you. I wanted to start off the day with a bit of an anecdote to kind of keep us -- to keep our eyes on the prize of what we're
actually concerned about here today. I was on the bus a couple of weeks ago, and I was overhearing an argument about some family issue post or pre Thanksgiving.

One of the parties said, "You know, the things we -- the things we value least are what we need the most in our lives."

Granted, in that circumstance, they were talking about a brother or a sister that was causing a little bit of a ruckus right before Thanksgiving. But in my mind, it struck me that the thing that we value the least but need the most is air, and that's what we're here about today. We're here about violations with respect to Allegheny County's Health Department rules and regulations concerning air quality.

You know, as humans we can go weeks without food and days without water and days without shelter, but you can hardly go a half hour without air. If you could, you'd be Superman. And so, really what we're talking about is one of the most essential elements that we are concerned with in our day-to-day lives, but yet we give the least consideration to.

And so, as we make our way through all of the technical details about what standards apply and what regulations apply and what levels of emissions that
we're concerned about come up and begin to confuse the
issue, I just wanted it to be in the back of
everybody's mind that this is the essential crux of
what we're concerned about, the air, the thing that we
all need the most, but give the least consideration
to.
filed with respect to our June 27 th -- or June 28,
2018 Enforcement Order. That enforcement order came
about as a result of over 300 violations of Article 21
of Allegheny County Rules and Regulations. They
imposed -- the Department imposed, as a result of
those violations, a penalty in excess of one million
dollars.
Granted, it should be noted that that penalty
is actually based on three quarters of violations.
But in addition to that, and in taking a look at those
violations that occurred, the Department gave due
consideration to measures that could reduce those
violations going forward and, in particular, to
address certain issues with respect to criteria
pollutants such as sodium dioxide -- or sulfur dioxide
and particulate matter of 2 microns -- 2.5 microns or
greater, both of which are -- are issues within
Allegheny county in terms of air quality. And in so
brunt of their displeasure with the Department today.

It is our obligation today, as the party bearing the burden of proof, to demonstrate by the substantial evidence that will be a part of this record that the -- that the penalties, as imposed, are legal, are not arbitrary, are not an abuse of the Department's discretion, and that, in fact, to the contrary, it -- they are contemplated under Article 21, they comport with the current civil penalty policy as imposed as of the date in which the penalties were created, and that the corrective measures are reasonable and attainable by U.S. Steel based on our analysis of their operation.

And so, I'll leave it at that, only noting that we will gladly and shortly meet that burden, and that we hope for a speedy resolution to this issue going forward to the extent that we can get cleaner air for the citizens of Allegheny County.

HEARING OFFICER SLATER: Thank you,
Mr. Willis. Mr. Dausch, do you want to make an opening statement?

MR. DAUSCH: Yes. It's not surprising that you've heard from the county about concerns about air

## losing their jobs.

The enforcement order includes a requirement that U.S. Steel hot idle two batteries at the Clairton plant if U.S. Steel doesn't meet certain requirements in the order. Hot idling means two of the coke batteries at the Clairton plant would have to stop producing coke. It's a last resort for coke plant operators because hot idling causes stress to batteries that either causes significant damage or, in a worse case, causes a total loss.

Depending on the damage, the cost to U.S. Steel could be tens of millions to $\$ 400$ million in a worst case scenario. That hot ideal provision is extreme, it's excessive, and it doesn't belong in the enforcement order.

And one of the things in the enforcement order that triggers hot idle is a new door leak standard that the Department just made and that applies to only one side of the doors on one of the batteries, which is the B Battery. See, at Clairton, there are 708 coke ovens, and every one of those ovens has two doors. There's a door on what's called the push side and a door on what's called the coke side. Those doors are subject to Federal and County regulations that say how many door leaks they can have
and still be compliant.
The Federal regulations are called NESHAP Regulations, and they were created to address some of the hazardous air pollutants that the County is concerned about. Those regulations took several years to develop, and the Department was involved. They were developed after studies were done to determine what's technologically feasible and what protects public health.

The B Battery at Clairton is 100 percent compliant with those regulations. The Department has tried to make an end run around the rule making process and put a new B Battery door Leak Standard in that cannot be met. The standard in the enforcement order is that if the coke side B Battery doors have more than 10 leaks in any month in the first six months of 2019, U.S. Steel has to hot idle two batteries.

Eleven leaks in a month, and you hot idle two batteries, and it might not even be the B Battery. That standard is more than nine times more stringent than the existing Federal standard, and U.S. Steel data shows that it's never been met on any sustained basis, and it doesn't make sense.

You're going to hear that the emissions from
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from fugitive emissions, and that means that those violations are not based on measurements that were taken from scientific equipment. It means those violations are based on emissions that individual inspectors claim to have seen with their eyes. And because that's the case, those inspectors have to follow very strict procedures.

They're called methods. You're going to hear a lot about methods in this hearing. Those methods exist to ensure that those inspectors follow procedures that are consistent, that are reliable, and that are correct.

That didn't happen. Not only did the inspectors not follow the proper methods, the county didn't follow the law when it in turn issued the penalties and violations and enforcement order. The County's failure to follow the law makes the entire enforcement order unlawful, and it makes it so that the entire order cannot stand.

The case can and should end right there, but the County was also unreasonable. In the enforcement order, there's a million-dollar penalty that isn't even the tip of the iceberg because the enforcement order also includes sanctions that could cost tens to hundreds of millions of dollars and result in people

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the B Battery doors are minimal in the overall scheme
of emissions, and the B Battery coke side doors have
special air control equipment that's not on any of the
other batteries at Clairton. And guess how many B
Batteries coke side door leaks are in the enforcement
order? (Indicating).
    The Department's right. It's their burden to
prove. They need to prove that the enforcement order
is both lawful and reasonable. It's neither of those
things. And after you hear the evidence, Mr. Slater,
we're going to ask that you vacate that order.
    HEARING OFFICER SLATER: Thank you,
Mr. Dausch. Mr. Willis, you may proceed with your
first witness.
    MR. DAUSCH: Mr. Slater, before we proceed,
    HEARING OFFICER SLATER: Oh, yes.
    MR. DAUSCH: -- should we put on the record
Joint Exhibits One and Two have been admitted into the
record?
    HEARING OFFICER SLATER: Yeah, I will --
yeah. For the record, Joint Exhibits One and Two are
admitted.
    MR. WILLIS: The Department would call Jim
Kelly.
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    JAMES KELLY, called as a witness, being
    previously sworn, testified as follows:
                DIRECT EXAMINATION
    BY MR. WILLIS:
Q. Mr. Kelly, could you give -- state your full
name for the record please?
A. My given name is James Lynn Kelly.
Q. Thank you. And what's your current
occupation?
A. I'm the Deputy Director of the Environmental
Health Bureau for the Allegheny County Health
Department.
Q. Now, how long have you had that position?
A. Since January of 2017.
Q. And what did you do before you had that
position?
A. I was in -- I was the Planning Section Chief
for the Air Quality Program.
Q. Okay. And before -- how long did you have
that position?
A. I had that position for about two years.
Q. And prior to that, where did you work?
A. I worked for the Georgia Environmental
Protection Division.
Q. And what did you do for them?
A. The last 11 years, I was the Program Manager for the Planning and Regulatory Development Unit for the state of Georgia.
Q. What did that job entail?
A. Planning for the entire State of Georgia for -- for basically incorporating the Clean Air Act Requirements and responding to the four non-attainment areas for the State of Georgia and making sure they comply with the Clean Air Requirements and to demonstrate attainment with those criteria pollutants
Q. Okay. And in terms of your education, I take it for granted that you've gone to high school, correct?
A. Yes.
Q. And where did you go after high school?
A. After high school, I went to West Virginia University of Student Technology where I achieved a bachelor's of science and mechanical engineering.
Q. And did you do any education after that?
A. Yes, I have a masters of science in public policy with a focus on environmental policy from Georgia Tech.
Q. Do you have -- did you have any further formal education after that?
A. Not as far as a degree.
Q. Okay. As far as anything else?
A. Well, I -- being in the position that I'm in, and anybody that works in air quality, there's constant education that you have to take to maintain, you know, knowledge just, you know, for the area that you work in.
Q. Okay. Could you explain for -- for the -for the sake of Mr . Slater and for the record the Clean Air Acts Regulatory Spleek Scheme?
A. Okay. So, the Clean -- this Air quality Program and any Air Quality Program in this country exists because of the Clean Air Act. Now, that's not withstanding the reality that the Allegheny County Health Department and the program that proceeded that actually existed before the Clean Air Act.

What the Clean Air Act does in -- for an Air Quality Program -- the basis is that you have issued permits, you enforce those permits, but also that you have to monitor and respond to violations of the criteria pollutants. And so, --
Q. What's a criteria pollutant?
A. And so, when -- the criteria pollutants are defined by the Clean Air Act, and they are pollutants for which there are health-based standards set. Those pollutants are SO2, for which all portions of

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Allegheny County is violating; there is NO2, which we
meet; there is ozone; and there is CO.
    Ozone, we are technically in violation of the
ozone standard. We're currently meeting the standard,
but we haven't been designated attaimment. And then
there's the fine particulate matter standard, which
the County is also failing the annual average, and
then there is lead.
    Those are the criteria pollutant. And when you
have a criteria pollutant, the EPA is required every
five years to evaluate those standards and set
standards based on public health, regardless of the
costs associated with setting those standards.
    Q. Okay.
    A. And if you want me to continue -- then the
obligation for agencies like us is that -- the
Allegheny County Health Department is -- the EPA sets
these standards. They require the agencies to put out
a monitoring network to monitor those standards and
report that data back to the EPA.
    When you violate that standard, then you have a
requirement under the Clean Air Act to come up with a
plan, which is a State Implementation Plan, that is
subject to the approval of the EPA to show how you
bring that area back into attainment with that
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criteria pollutant.
Q. Okay. Now, you've gone over a lot of things
here. You mentioned the State Implementation Plan.
A. Yes.
Q. And that's a requirement under the Clean Air
Act for every state to provide?
A. Yes.
Q. To come up with a plan?
A. And that is broad. So, a lot of people are confused with what a State Implementation Plan is. And, again, our plan is -- we are a local agency. We have to submit our portion of the plan to the state of Penneylvania and the State of Pennsylvania submits that to the EPA. But our obligation -- basically all of the programs that we have that incorporate those provisions of the Clean Air Act is submitted to the EPA as a State Implementation Plan.

And one of the things that affects this case today is the fact that since we axe violating both the SO2 and the particulate matter standard, the fine particulate matter standard, is we have an obligation to submit a revision to that plan to show how we demonstrate those standards.
Q. Okay. Just to back up a little bit, could you explain to Mr. Slater and to the record what NAAQS

[^0]A. So, that's the National Ambient Air Quality

Standard. So, the EPA has defined six criteria pollutants, and then the Clean Air Act dictates that the EPA, like I said before, every five years needs to evaluate those six pollutants and develop a standard called the National Ambient Air Quality Standard that is protective of public health.
Q. Since we're going through definitions, could you explain what NESHAP is?
A. So, NESHAP is the National Emissions Standard for Hazardous Air Pollutants. So, that is part of the Clean Air Act as well. The Clean Air Act defines pollutants. There are criteria pollutants, which you have a monitor network for, and then the Clean Air Act also identifies 187 hazardous air pollutants.

The EPA is required to come up with a standard to meet those pollutants. Now, this standard is not a health-based standard. It is not a monitored standard.

So, for criteria pollutants, we put out monitors, and we monitor the air to make sure -- we have a monitor on the ceiling -- the roof of this building. And so, that's the combination of all of the pollutants. And so, in NESHAP, that is a -- it will
set max standards that are specific to that industry.
Q. Okay.
A. And that -- yeah. And it's technology based. It's not specifically health based. So, basically, the top 12 highest performing is the basis of the -you know, the top 12 highest performing types of controlled technology applies to that standard.
Q. Okay. And you mentioned earlier that -- that the -- that our region was not in attainment for which criteria pollutants?
A. For SO2, sulfur dioxide; and for fine particulate matter, which is particulate matter that is 2.5 microns or smaller. The significance of which that is, is it's the size of particulate matter that you can breathe into your lungs, and it can actually cross into your blood level causing serious health issues.
Q. I see. And could you explain the monitoring system and the pollutants in that system that are being monitored in our current monitoring system? Are our --
A. So, we have a county-wide monitoring system. It's arguably one of the densest monitoring system networks in the country. We have a monitor, the Liberty Monitor, which is failing the particulate

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matter standard in the Mon-Valley, and that same
monitor also has an SO2 monitor that is failing the
standard as well. All of the other monitors are
meeting those standards across the county. We have
nine particulate matter sites, and we have three SO2
sites.
    Q. Is .-
    A. Does that help answer your question?
    Q. Yes, it does. I was trying to figure out how
it is that the -- we've been designated as
non-attainment for those particular criteria
pollutants?
    A. Yeah. We have co-located monitors at one
site, and both of those monitors are failing to meet
the standards of NAAQS, the National Ambient Air
quality Standards, for the criteria pollutants fine
particulate matter and for SO2.
    Q. Okay. And you mentioned one of the monitors
is at Liberty. Where is that located?
    A. That's at the Avalon High School.
    Q. It's at the Avalon High School?
    A. Yes.
    Q. Is it --
    A. I'm sorry, South Allegheny High School.
    Q. South Allegheny?
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    A. South Allegheny, I'm sorry.
    Q. It's all right. So, it's sitting on the
    3 school property somewhere?
A. Yes.
Q. I see. Is it possible for a region to
fall -- well, let's back up. Let's talk about the SIP
for a second. What is the County's contribution to
the Commonwealth of Pennsylvania SIP, and how do we
develop that?
A. So, we -- since we are a local control
agency, we have all jurisdiction within Allegheny
County. Part of that reason being is we actually
existed before the Clean Air Act and before a lot of
the infrastructure for the state. But we have
delegative authority under the Pennsylvania Air
Control Act to exist as -- basically with the full
authority of the Clean Air Act to, you know, develop a
Air Quality Program.
Local agencies are a little unusual. Not a lot
of states actually have local agencies, and not all of
those states are delegated all of those efforts. And
so, those efforts being the permitting program, SIP
development, and especially the provision for
maintaining a monitoring network. Usually the State
will do that for the entire state and won't -- that's
why we have a denser network than you'll find in most
other areas.
Q. And what do we actually provide the state in
terms of materials? Do we -- the regulations, are
those incorporated as part of the SIP?
A. Yes. So, all of our regulations -- almost --
most of our regulations in Article 21 -- Article 21 is
the articles that we use to protect air quality here
in Allegheny County, and those regulations that are
specific to the provisions of the Clean Air Act will
be submitted to EPA through Pennsylvania Department
of Environmental Protection for approval into that
plan. And so, that -- what that does is, is it makes
those federally enforceable.
Q. Does the state have an opportunity to review
our portion of that?
A. Yes, they do.
Q. Okay. So, do they have any say in terms of
approval for submission to the EPA?
A. They do have -- well, they -- the EPA
approves them ultimately, but basically -- with the
EPA, it's basically a pass through. They -- as far as
I know, they have never not approved the approach that
we have taken.
Q. Okay. And once it's been approved by the
EPA, what effect does it have to the SIP?
A. Well, it makes it federally enforceable.
Q. So, with respect to Article 21 , did that
incorporation make that a federally enforceable
article?
A. Yes, for those provisions that were submitted
to the EPA to request approval. Not everything in
Article 21 has been approved by the EPA, but
overwhelmingly they have. Like the Coke Oven Emission
Rule, that is a rule from a previous SIP that was
required to be more etringent than State or Federal
Regulations because the area had failed to attain --
the Clean Air Act says that you need to come up with
whatever measures are necessary to meet those criteria
pollutant -- to meet the NAAQS.
And so, we have rules that are more stringent
than what the State or Federal Government would
require, and then we submit those to the EPA, and the
EPA has the capability of enforcing those.
Q. You've raised an interesting point. With
respect to the -- the NESHAP, that's a national
standard?
A. Yeah. That's a national standard that
applies to the facility and basically to the
equipment. It defines which control equipment that
you need to operate. So, it's not -- even though it is response, it's response to the -- they have, you know, the 187 hazardous air pollutants that the Clean Air Act defines, and then the Clean Air Act says that the EPA has to come up with standards for those.

And again, those standards are for the facility, not for the air. So, it's not basically a healthbased standard. Which is interesting because it's an air toxic, and you would think it's a health-based standard, but it's a performance standard.

It's basically you look at the 12 percent best performing, like, boilers. You know, there are thousands of boilers across the country. The NAAQS saye you look at the top 12 percent best performing, and that is the requirement that will be subject.

Coke ovens are a little interesting because we don't have a lot of coke ovens, and so -- I wasn't involved in the development of those NAAQS standards, but there wasn't a whole lot to look at. So, --
Q. When was that NAAQS -- do you know when that NAAQS standard was developed?
A. I really -- I don't know.
Q. Was it in the '00's or the '90's?
A. I couldn't tell you for sure, sir.
Q. Okay. Let's see. Just because -- okay. And

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with respect to the SIP, you indicated that if we are out of attainment, that that SIP requires us to come up with some method to come back into attainment?
A. Yes. Yes, it does.
Q. What are the methods that can be employed to come into attainment?
A. So, the Clean Air Act gives us the authority to basically do what's necessary. They'll require reasonably available controlled technology under certain situations. And like for Ozone, that's fairly well defined. In this situation, it's not. They give us certain rules and regulations and, you know, permitting requirements and things like that, that allow us to be more stringent.

But specifically, the bottom line is, is that requires us to submit an attainment demonstration. That attainment demonstration says by a certain year in the future, we have to come up with a plan with regulations or permitting requirements to reduce emissions to meet that, and that's where we become more stringent than the Federal rules or the State rules.

Because it is a non-attainment area, it requires a unique approach that is specific to the industry 5 that we have, the problems that we have, and the air
pollution that we have to meet that standard. That is why we currently have arguably the most stringent coke oven regulation in the country.

This coke oven exists in a non-attainment area and it's putting public health at risk. That standard is failing. It has continued to fail. And then we have to -- you know, that rule is more stringent because of that reason.

That NESHAP really doesn't help us with that. That NESHAP is for a different reason altogether. It's not protective of the criteria pollutants SO2 and PM 2.5. It is only set as a technology standard for those hazardous air pollutants.
Q. I see. All right. You mentioned permitting as an avenue through which we can -- we can bring ourselves into attainment. Have we done that with respect to U.S. Steel? Has there been any --
A. Yes.
Q. -- permitting activity that would bring them -- that, at least on its face, would bring them into attain- -- bring us into attainment?
A. Yes. So, we recently submitted an so2 attainment demonstration that was recently proposed by the EPA for approval. And within that, instead of adopting a new rule, we adopted permit conditions and

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revised the permits to include those more stringent emission limits at the facility like stack emissions, fugitive emissions, and various things like that.

An emission limit, like in pounds per hour. Like this stack can only emit, like, 10 pounds per hour of SO2. That's an example of what that would be. So, the permit specifies what those limita are.
Q. And you mentioned a demonstration. How do you go about demonstrating coming into compliance?
A. So, the demonstration -- the Clean Air Act is very specific. It give日 you very specific criteria for what you need to do to submit a state Implementation Plan, a SIP demonstration. One of those things is you develop an emission inventory, and then you have to do the modeling based on that emission inventory from the past and make sure your model works. And then you have to come with a sweep of emission controls and emission reductions. And that could be an interrupt process.

And so, say for $P M$, we need to attain by 2021. And so, we put in a number of emission controls and run the model. It takes, you know, the emissions inventory from the past, we add those -- whether it's permit conditions or rules and regulations that reduces those emissions, and it sets a type of
meteorology from a time in the past, and you project that to the future and it runs that.

And if we come in below -- at or below that
standard, then it shows attainment. And so, there can be several iterations.
Q. Does any of that take into consideration compliance?
A. No, it doesn't. There's no way we could do that. It's just assuming that we are meeting the standard. And I forgot to mention -- so, that's a -it's a computer simulation. It's a model. It's a model platform.
Q. Okay. And with respect to an emission inventory, how are those used in the compliance -well, not the compliance demonstration, but for the SIP demonstration?
A. So, we start with a National Emissions Inventory, which is something that we have to submit to EPA every year for large sources and every three years for smaller sources, so we have that basis. And then for SIP planning, we have to improve upon that because it's -- for some sources, it's really good.

Let's say a power plant. They all have continuous emission monitors. We know exactly what's coming out of those plants 24 hours a day. And so we
have really good data, and so we don't have to improve upon that.

But let's say for a coke oven. So, that's -there's a lot of emissions. And we probably need to talk about, you know, how a coke oven operates, so you can say -- so, you have fugitive emissions sources. So, when you have stack emissions, that's easier to calculate. But then when you have fugitive emissions, leaks of gases and plumes and smoke from different places, that's really hard, and the SIP doesn't do a really good job of that. You make some estimates.

I know we've worked with U.S. Steel in the past to estimate certain emissions for door leaks and things like that, but it doesn't -- you know, it's really messy, and it's not really -- you know, the National Emissions Inventory doesn't well represent that.

And so, we take that, and then we have to look at the plant's operation and try to find a better way of improving that. And sometimes the model responds well, but some forms show no, there's got to be some more emission from there regardless of what the 23 National Emissions Inventory is because we know that 24 this is coming from there. We don't know much, but 25 the model is showing a response to that.

Does that make sense?
Q. Yeah, it does. But they -- U.S. Steel, and frankly all Title Five Sources, will have to submit to the Commonwealth of Pennsylvania an emissions inventory that we subsequently review? That's -- we review that submission?
A. We -- I believe we probably -- we submit it to the EPA eventually, so yes.
Q. Okay. And with respect to that, does the -does the emissions inventory take into consideration violations?
A. No, it doesn't.
Q. But it's used as a part of the SIP process?
A. Yes. It's the start of a SIP process.
Q. The start of a SIP process?
A. Yeah. Because, again, the SIP -- well, you know, we have to model actual emissions. And the emissions inventory is not always your best -- you know, considering we have, what, 400 sources of emissions, we're not going to be able to scrutinize to death every one of those sources if they have non-stack emissions to make sure they're the best emissions.

We have to use emission factors and data that U.S. Steel provides us that's maybe the only data that 32
we have to try to come up with what those emissions are.
Q. And then -- I'm sorry. I just wanted to ask really quickly, by stack you mean smoke stack?
A. Yes, a smoke stack.
Q. Okay.
A. Those emissions are a lot easier because
they're a steady state. You know the volume, you know the temperature, you know the fuels that are going into it, the pollutants, and whether there's a control device. So, you can make pretty good calculations, even if you don't have a monitor located in that stack that gives you a feedback and tells you what's there.

But then when you have fugitive emissions, like coke ovens, you know, you can have lots of leaks here and there, and it's really difficult to determine what those emissions are going to be.
Q. And you mentioned stacks having monitors?
A. Yes.
Q. Are you talking about COMS?
A. So, COMS is a sort -- is a type of monitor. So, there are CEMs, a Continuous Emission Monitor, that tells you what that pollutant is. Like for a power plant, SO2. You've got a monitor that says what the SO2 is.

But then in some stacks, you have particulate matter standards. And so, there's no real good technology for measuring particulate matter. The EPA has been working on that for a while, and they do have some procedures in place for some companies.

But what's typically used is what's called COMS, which is a Continuous Opacity Monitor. And so, what that does is it shoots a beam of light across the stack and returns. And then that monitor is going to read what is -- how much that light is diminished. And basically, that's going to tell you -- that's the percentage of smoke that's in the stack.

So, let's say zero to 100 percent is you can't see anything through it. But if that stack (sic) goes through and comes back and gives you a reading of 50 percent, well, that's fifty percent opacity. And there's going to be some emission factors that's going to associate that with a relative particulate matter emission rate. It's a surrogate, is basically what it is. And so, it's trying to approximate particulate matter.
Q. So, it's a stand-in for what would otherwise would be a SIM, something that would --
A. Yes. It's a surrogate. It's a stand-in. It's --
Q. And you've mentioned the Liberty Monitor. Do stack emissions -- are stack emissions picked up by that monitor?
A. Yes.
Q. How about fugitive emissions?
A. Yes, probably. So, stack emissions, keep in mind, -- so, when you have a stack, the stack has temperature and velocity. And the reason stacks -it's like the oldest type of control device that you have. It's not really a control device, but it's a method of pollutant -- pollution dispersion.

And so, you have tall stacks and they're hot and they have velocity. So, the pollutants, they come out and they're pushed high into the air and they disperse.

Fugitive emissions, they just -- say you have a battery and it just leaks and it stays close to the ground. And so, -- the Iiberty Monitor is not that far away. And so, depending on the meteorology, fugitive emissions, you can argue, may have a higher chance of -- a higher percentage of those fugitives could have a bigger impact, let's say, per ton.

Let's say this stack, 100 tons of PM come out of it, and so it's going to disperse, but only a portion of that is going to reach that monitor. Let's say
just arbitrarily -- so, 100 tons of pollution comes out of there a day, and maybe 10 tons may be able to reach that monitor. I know that's a very rough approximation.

But fugitives, -- well, that monitor is on the ground. Well, it's at the high school, so it's probably on the roof. And so, those fugitive don't go very far. They don't have that ability to disperse. So, if the wind is blowing right, those fugitives are going straight to that monitor. So. A higher percentage of those fugitives -- so, it's what we call sensitivity.
Q. Okay.
A. It's like -- the best way to talk about this is ozone. The biggest contribution -- ozone is a secondary form of a pollutant, and so you have to have oxides of nitrogen. They come from burning fuel. And then you have volatile organic compounds, like gasoline. They have to form to create ozone.

Power plants produce the most emissions, arguably, for that, but then they're the easiest to control. But power plants are farther away. They're produced as background. But your cars, you know, they're roughly 40 or 50 percent of your total emissions for NAAQS, but almost 100 percent of that
turns into ozone because it's right there where the monitor is.

So, ozone forms with volatile organic compounds and nitrogen oxides at the ground level, and that's where people are breathing it. The cars are emitting right there, and it's turning in. Whereas this power plant, it's dispersing, it's going up into the stratosphere, and so not as much of that can actually form at the ground level. So, does that make sense?
Q. Yes.
A. So, the fugitive emissions are at ground level, and they can have a higher sensitivity. More -- a higher percentage of that pollutant can be related to the monitor, as opposed to a stack, even though the stack emissions can be a much higher number.
Q. I see. Before we get too far down the trail of what a -- about this particular coke facility, I would like you to give us -- Mr. Slater and the record an understanding of what is a coke facility, and why we are concerned about it? Could you explain to Mr. Slater what a coke facility is?
A. Okay. To really oversimplify this, and I know that there are people -- people in here that will probably cringe at this. So, to visually look at what
a coke oven looks like, say a loaf of bread. And so, they are a long, thin battery of ovens. And so, each slice of bread, say, is a separate oven.

And so, this coke oven -- coke ovens can be well over 100 feet long, you know, usually maybe close to the length of a football field, and they have these individual ovens that are, like, 18 inches wide. And so, like, each slice of bread is an oven, and all of these ovens are stacked together.

And in each one of those ovens, what you do is you open ports at the top, and you drop coal into it. And then for a minimum of probably 19 hours or so, you're cooking that coal sealed off and in the absence of oxygen to create what's called coke. And so, you're baking it for, let's say, 20 hours, it's close to 2,000 degrees, and then what happens to that -- to that coal is it becomes coke and all of the volatiles.

So, the reason -- you know, a piece of coal has a lot of things in it. And so, when you heat it up in the absence of oxygen, things start to volatilize. You have tars, you have light oils, you have benzene, you have a lot of toxic -- all of these things are driven off and to the point where all you have left is basically a chunk of carbon.

But those volatiles are -- are a very useful
product, and so they are all collected. The light oils, the tars, the benzene is withdrawn, and even however much sulfur comes out of it. But then the gases in general -- once all of those useful producte are striped out of the gas, you have what's called coke oven gas. So, I'd say it's something like natural gas, with half the BTU content.

And that gas, after you withdraw all of these other valuable components that are used in the chemical's industry, that gas is actually used back in the oven to heat that oven up. That's the -- that's the actual fuel that's used in the oven to create that temperature to create coke. So, you have this oven that drives off these volatiles. You collect that, the gas comes back, and you heat it -- you know, it's used to heat the oven.

That coke goes on. It's used in the iron making process. You know, that gives you your heat, but it also helps to extract the iron oxide from the ore as well. So, we won't get into that because it's a little more complicated.

So, once that's done -- coke ovens are a very
manual process. So, you have to -- there's a door on each side of the piece of bread. You have one door that you open up and then this rod comes in and pushes
all the coke out and the other doors open up and it pushes that out.

So, if the coke oven -- so, if the coke is coked out pretty good, that process should be pretty clean, and you shouldn't see a lot of smoke or emissions. Again, this is a big opportunity for emissions. And then that -- that coke is dropped into a cart, and it's taken to a quench tower where it's quenched. And then from there, it works its way to the iron plants.
Q. And what do you mean by quench?
A. So, they drop a lot of water on it to cool it down in a hurry.

HEARING OFFICER SLATER: And, Mr. Kelly, just to clarify, the two doors that you were referring to were the push door and the coke door?

MR. KELLY: Yes, the push door is where you initiate, yes.

HEARING OFFICER SLATER: All right.
MR. KELLY: Does that help?
HEARING OFFICER SLATER: Yeah. I'm just
making sure.
MR. KELLY: And the coke side door is where it comes out.

HEARING OFFICER SLATER: Okay.
MR. KELLY: And that's -- that's where you
typically have your emissions from the doors. Now, you've got a lot of opportunities -- again, you know, this is -- this is kind of old technology. The doors can leak. When you have a door that's leaking, that's raw coke oven gas.

Raw coke oven gas is actually listed as one of those 187 air toxics as a hazardous air pollutant
by the EPA. And that coke oven gas that's leaking out, it includes what we call BTEX, which is benzene, toluene, ethylbenzene, and xylene, and all of those are listed as the 187 hazardous air pollutants by EPA.

You have opportunities when you're charging
the coke oven, which is when you actually fill it up
with coal, for the emissions as well because, you know, it's still hot in there, and you have an opportunity for that. You have an opportunity for emission during soaking. And so, what soaking means is the coal -- 20 hours, it's coked out. And so -BY MR. WILLIS:
Q. If I could just --
A. Yeah.
Q. If I could just stop you right there, so we can -- so we can go through this process, the coke making process step-by-step?
A. Yes.

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[^1] And

0 Q. And what do you mean by quench?
Q. The first step you mentioned was the dropping
of the coal --
A. Yes.
Q. -- into the oven?
A. Yes, that's charging.
Q. That's charging?
A. Yes.
Q. And then you were going to describe soaking
next?
A. You charge and then you coke and then soaking
happens before you push. And so, like I said, you're
-- this battery is collecting all of the gases and
volatiles that's coming off the coke. And so, once
it's coked out, there shouldn't be any more left. And
so, when you damp that off, you're not collecting it
anymore, and you open these ports to vent it before
you push to make sure there's nothing left in there.
So, that's an opportunity for emissions as well.
Again, if the coke is -- if the coke oven is
operating properly, and everything is coked out, you
really shouldn't see many emissions. And then after
soaking, then you push.
Q. Okay. And if you could describe the -- the
chemical -- well, let's say we open a door lo hours
into the coking cycle on the coke side of the battery,
into the coking cycle on the coke side of the battery
what would happen, theoretically, once you opened that
door and introduce it to air?
A. Well, number one, there's the coke oven gas
-- but it can combust, and that's when you -- that's
when you're going to see massive amounts of dark
smoke. So, again, you're heating this up in the
absence of oxygen to drive these components off.
That's above the combustion temperature. And if there
are still components in there, that's going to catch
fire.
Q. Okay. And in terms of the chemical
composition of any of these chemicals, could you
describe what happens to the primary pollutants that
we're concerned about here?
A. Okay. So, again, obviously there's the issue with hazardous air pollutants. But then for the criteria pollutants, there's a large amount of particulate matter and oxides of sulfur. So, you're going to have SO2 form because it's combustion. That coke oven gas also contains hydrogen sulfide, which is the -- the rotten egg smell.

But then again, you have those two components for the criteria pollutants, which would be SO2, because it's combustion of coal, and the H2S can catch fire as well. And then you have the particulate matter. Any
time you see visible emissions, that's particulate matter.
Q. So, in terms of the chemistry, the -- the H2S that is present in the oven prior to the door being opened, once it hits the oxygen in the air, does that change the chemistry of the H 2 S , or does it remain H2S, and you'd have --
A. Well, if you're talking about a door leak, you know, when you have your coke oven gas emitting into the atmosphere, H2S is a big component in that. Like, if you open the door prior to coking, then it's going to combust, and then H 2 S can actually turn into so2.

But H2S really doesn't persist very long in the atmosphere. It's eventually going to break down into oxides of sulfur, SO2 being one of those.
Q. I see. And this is what's being picked up at the monitors?
A. So, the monitors -- the primary purpose of those monitors is, again, for the criteria pollutants SO2 and fine particulate matter. But the same monitoring location has an H2S monitor as well as a benzene monitor.
Q. Okay. At Liberty?
A. Yes.
Q. Okay. Could you describe the health risks as you know them to be with respect to those compounds that are coming out, the fugitive emissions?
A. For -- for which one? I mean, there's -again, these fugitive emissions. There's a mess there. There's PM, you know, there's ozone issues. You know, PM causes respiratory issues, heart aliments, distress as well. And SO- --

HEARING OFFICER SLATER: PM is particulate matter?

MR. KELLY: Yeah, I'm sorry, particulate matter. And it's the fine particulate matter. That's the primary issue there. And then SO2, again, it causes a lot of respiratory issues and heart issues as well. But then you have all of the toxics. I mean, once you have the toxic components, besides other detrimental health effects, you know, you have your risk of cancer for prolonged exposure.
BY MR. WILLIS:
Q. Are you talking about BTEX in that regard?
A. Yes. And again, coke oven gas as a whole is identified by EPA as an air toxic, and it contains not only the BTEX; that benzene, the toluene, the ethylbenzene, and xylene, which are the nastiest, it also contains a host of other things as well.
Q. Okay.
A. Including a large amount of H2S.
Q. Are you familiar with the -- the shed on the coke side of Battery B?
A. Yes.
Q. There are certain gases that you've mentioned thus far. And beyond the particulate matter, are those gases that would escape the coke -- the battery doors, are those being captured by the shed?
A. No. That's not what the shed is designed for. So, you know, to help Max out here, -- so, typically you have just a coke battery -- again, picture that loaf of bread -- out in the open. You push and then, you know, there's nothing collecting those emissions. Well, Battery B, it actually has -on the coke side, it actually has a control device that is designed to capture those pushing emissions.

So, when you push them out -- because, you know, you can have a lot of emissions during pushing -- it's collected in a car. The shed is designed to capture those emissions, but only the particulate matter because it's a bag house. Bag houses only collect particulate matter.

Any gaseous emissions are not going to be collected. They'll go through the bag house and right
off into the atmosphere. But a concern that we do have is that that shed was not designed to capture leaking door emissions because they're -- they're right there, and the shed is not airtight. And so, those door emissions can leak.

And our inspectors have actually observed those emissions just leaking out right in front of the shed because they're right there at the edge. And so, again, that's coke oven gas. That's particulate matter. And back to the shed, the shed cannot control gaseous emissions.
Q. So, it's my understanding, and correct me if I'm wrong, the shed is not fully enclosed?
A. No. So, it's open on both ends, and it's -there's -- you know, there's some space between the battery and the top of the shed as well. There's a gap, you know, between there, so it's not fully enclosed.
Q. Okay. I'll keep moving right along here. With respect to our Enforcement Order that's at issue, can you tell me specifically what it was intended to address?
A. Primarily, it is intended to address that you're in compliance. Very specifically identified in here, you have places where they were at 100 percent

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1 compliance, and now they're at 70 percent. So, I
mean, it shows that the numbers are there. They were able to do better in the past, and they're not doing it now.

And it's also to address the on-going issues with the deteriorating air quality being read at the Liberty Monitor. This area has been at non-attainment for a long time. And, again, we have that Liberty Monitor that measures both PM and SO2. There's been a decades-long trend of decreasing emissions. Starting in 2014, those emissions are starting to go back up.
Q. Now, you need to qualify that. Is it going back up county wide?
A. No, no. County wide emissions still continue to decrease, with the exception of 2017. There was a bump, you know, not only in the county, but regionally where, you know, emissions went up a little bit. They went up more at Liberty. But before that, all of the other County monitors continued to decrease, where as the Liberty Monitor was increasing that value above the standard each year.
Q. Okay. And just to be clear, you signed that Enforcement Order that's at issue today?
A. Yes.
Q. Okay. So, you had an opportunity to review

## it?

A. Yes.
Q. Did anything about the civil penalty that was imposed or any of the corrective actions that were requested -- did any of that strike you as unreasonable?
A. No. Now, you have to keep in mind that this is for two consecutive quarters. This is not for one quarter. We had just initiated our new Civil Penalty Policy, so we had an expectation that -- you know, for repeated violations, that there was going to be an accelerator for that, and there's going to be a component that could increase that.
Q. You mentioned the Civil Penalty Policy. When did that go into effect?
A. That went into effect January of 2018.
Q. And when did this order go out?
A. This order went out June $28,2018$.
Q. So, the Penalty Policy was already in place at the time that the order was issued?
A. Yes.
Q. Do the -- the penalty that was imposed, do you believe that's something that can be achieved by U.S. Steel? And I'm going to be specific. With respect to the B Side Battery -- or coke side Battery

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B 10 door Leak Standard, do you believe that that is
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something that can be achieved by U.S. Steel?
A. I absolutely do. Obviously, nothing in this order requires something that U.S. Steel hasn't demonstrated that they did in the past. There are specific examples in here for a lot of things. You know, the compliance rates -- obviously they show that things are getting worse. We just need to be better. Okay? And so, they have been.

With Battery B, that's an interesting situation because we did -- we looked back. There was a five-month period in 2015 where, you know, there's, like, two door leaks a month, or something like that, something really low. So, they have achieved that in the past.

But it's also interesting to note that Battery B, since it has a shed -- Article 21 requires a -- you know, they have a specification for door leaks. The problem is that we have a procedures manual that conflicts with that. And so U.S. Steel kind of gets a -- you know, they kind of get a gimme on that.

They actually don't have to take care of their doors, so they haven't been because the procedures manual allows them to -- because there's some restrictions manual for reading those doors, so that
keeps them from reading them and complying with
Article 21. And so, basically, they haven't been taking care of those doors.

And, again, that's speculation because they don't have to because they're not subject to those provisions for the coke side Battery B, as they are on all of the others.
Q. Now, let's make one thing clear about that. So, we've been following the manual, and is that the Source Testing Manual?
A. Yes, that's the Source Testing Manual.
Q. We've been making use of the Source Testing Manual in terms of compliance with the coke side of Battery B in that we do not do any -- we do not penalize them for exceedances on that side?
A. For the door leaks, yes.
Q. For door leaks on that side, even though the regulation requires --
A. You're correct. The regulation requires, you know, limits for those door leaks.
Q. So, is it fair to say that up until now -- up until this Enforcement Order, U.S. Steel has had the benefit of having door leaks on that side without any penalty?
A. Yes.
Q. -- and ACHD Inspections --
A. Yes.
Q. -- to determine the compliance percentage?
A. Yes.
Q. Is that fair?
A. Yes.
Q. So, to your knowledge -- there were other
Q. Is it fair to say that if there are fewer violations, there would be less emissions?
A. Absolutely.
Q. And to take that one step further, if we said that there were fewer emissions; SO2, BTEX, and benzene -- well, I guess benzene is BTEX.
A. Yeah, BTEX.
Q. That that will reduce the health risk to the public?
A. Yes.
Q. Okay.
A. We are a Public Health Department, and so our main need is for the protection of public health.
Q. In the Enforcement Order, to your recollection, we do not outright shut down the facility; am I correct on that?
A. No, we do not.
Q. And is there -- beyond the requirement that there be improvement, is there any specific threshold that they must meet to demonstrate improvement? Did we say, "You have to have five percent improvement"?
A. You have to improve basically by a minimum standard of the compliance record for, let's say, 20--- the first quarter of 2018. That's the standard. You just have to do better than the first quarter of

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2018.
Q. And by first quarter of 2018, what's the metric that we use to determine performance for the two quarters?
A. That's the average of compliance for all fugitive and COMS emission across the plant.
Q. Is it just COMS, or are there other components to that?
A. The inspections as well.
Q. Our inspections?
A. Our inspections. The 303 Inspections, which we can deduce the violations of our standards.
Q. So, the baseline is the summation of the COMS data from the Continuous Opacity Monitors, plus the --
A. Inspections. inspections, --
A. Yes.



> Q. -- the Karamida Inspections, or third-party

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requirements and I believe there was a requirement for
a plan and some other testing. To date, has there --
is U.S. Steel in compliance with that order?
    A. Yes, they're absolutely in compliance with
everything required by the order. They had 60 days to
submit a plan. We've reviewed the plan, we approved
the plan, and they've initiated the plan.
    Q. To your knowledge, is there anything that
would -- and just based on your review of the records
and your understanding of this facility -- you already
mentioned that there was five months in which they had
-- were under the 10 leaks?
    A. The 10 door leaks, yes.
    Q. The 10 door leak requirement. Is there
anything, to your mind, that would preclude them from
getting six months, as opposed to five months?
    A. No. I mean, I don't understand why. I mean,
it's just basically operation. You know, we're not
requiring them to install any control devices. Do
what you've done in the past. You've demonstrated
that you can do it. So, I really don't understand
where there's an argument that it can't be done.
    Q. I understand. And with respect to the hot
idling provisions that are in there, is there -- what
triggers that, to your recollection?
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A. So, the baseline is going to be the
compliance average from 2018. So, you know, there's going to be a number there. So, what is the compliance? And so, you get the first quarter of 2019, and you have to be better than that. And then the second quarter of 2019, you have to be better than that.
Q. Better than --
A. Better than that quarter before. So, the first quarter of 2019 has to be better than the first quarter of 2018. And then the second quarter of 2019 as to be better than that preceding quarter.
Q. And so, that is just continuing improvement?
A. Yes, showing a continuing improvement.
Q. Okay.
A. It's not just doing it and step out. I mean, you have to show that you're continuing to improve.
Q. And we didn't -- we did not impose any requirements as to -- well, let me take that back. We did not tell U.S. Steel what to do in order to reach that compliance?
A. No, they -- we just wanted a plan that we would approve, and it was up to them. They had the flexibility to determine how to meat the order.
Q. So, basically the success of failure is

really dependent upon their plan --
A. Yes.
Q. -- that they provided to the County?
A. Yes. The plan addressed those concerns that we had.
Q. How so?
A. We have pushing issues. We have door leak
issues. And so, the plan shows that they have
something in place to address those concerns.
Q. To your recollection, did the plan involve the addition of staff?
A. Yes, training and staff.
Q. Training and staff?
A. Yes.
Q. Do you believe that training and staff is sufficient to remedy the problems that we outlined in the order?
A. Absolutely. I mean, -- again, because this facility was demonstrating that in the past. I know, our inspectors have -- they've observed, in the last few years, a degradation in the training and the approach to maintenance and, you know, those concerns. There's just declining quality control at the facility.
Q. Do you recall --

MR. WILLIS: And just for the sake of your understanding, Mr. Slater and opposing counsel, I would just like to ask the questions of the witness and then go through the exhibits, just because I don't have the flow to manage them both at the same time. So, I'm going to go through exhibits at the end of each of the witness' testimony just to make it flow a little bit better.

HEARING OFFICER SLATER: That's fine with me. BY MR. WILLIS:
Q. Okay. Are you aware of the 2016 Consent Judgment --
A. Yes.
Q. -- involving U.S. Steel and the County?
A. Yes.
Q. Were you a part of that?
A. No, I was not.
Q. Okay. What -- you were still with the

Department in 2016?
A. I was in Planning.
Q. You were in Planning?
A. Yes.
Q. When did you get elevated to Deputy Director?
A. January 2017.
Q. So, this judgment was already in place when
you took over?
A. Yes.
Q. Would you agree that COMS data is an
important metric in determining performance?
A. It is part of the story.
Q. How is it part of the story?
A. Well, the COMS -- well, I'm just going to
tell you. Those are for combustion stacks. And so, what they are doing is --
Q. What's a combustion stack?
A. So, remember when I talked about earlier how we have this coke oven gas? You know, you coke the coal, the gaseous volatiles come off, you strip those things that you want out of that, and then the remaining gas comes back to the battery to heat it. And so, it's fired underneath and then, you know, it comes up in between the ovens and that stack basically is collecting those emissions.

And so it's got to go somewhere. So, when you're burning that coke oven gas, it's still -- even though it's cleaned and stripped, it's still relatively dirty gas, and it's going to the stacks.

And so, the COMS, obviously, are measuring the emission in that stack. If it was just raw coke oven gas, -- I mean, if it was just the processed coke oven
gas being burned and going up that stack, there really shouldn't be any visual emissions that the COMS would read. You know, there should be very, very little, if any.

So, what the COMS can do, is it -- it's going to give you an indicator of when you have problems with the battery itself and how that battery is operating as far as the combustion. If you have leaks in this, -- so, again, when we go back to that loaf of bread, and you have all of those individual ovens. Well, between each loaf of bread is an area --

HEARING OFFICER SLATER: Slice of bread.
MR. KELLY: Yeah, I'm sorry. Between each slice of bread, there's an area underneath and below and between where you're combusting this gas to heat the oven. And so, over time, you can degrade, and you can have holes.

And so, you're going to get, you know, emissions that are coming into the combustion area, and you'll have various problems. You can have clogs and stuff like that. And then you're going to start getting that smoke.

So, that COM is just basically saying how well of shape that this coke oven is. If it hasn't 5 been maintained, you're going to have stuff coming
from the coke in the oven leaking through the walls
into that combusted gas going up the stack, and you're
going to have increased emissions.
And so, the COM is only telling you basically
whether that -- and this is a little bit of an
oversimplification because, again, there is damping
and there are some other things that you can do. But
it's basically telling you that the coke oven itself
is in good enough shape, that it's, you know, solid, and you shouldn't have many leaks and the emission aren't that high.

So, that's basically half the equation to operating a coke oven is, like, whether it's fundamentally sound.
By Mr. WILLIS:
Q. If -- if -- if the operating -- let's say the facility is not operating as it should, would the COMS remain as important as they are or were in the past?
A. Well, again, I hesitate to place a lot of importance because, again, that's half the equation. you can have a perfectly -- you know, you can have a brand new coke oven, and you're COMS are nothing. But then you're not taking care of door leaks, pushing, and charging, and you can have a ton of other emissions. And so, that's the way you have to look at
it. That's -- I'm sorry. I'll get back to your question.
Q. Yes.
A. So, there's one thing that the coke oven is in shape, and then there's the other thing of how are you operating the coke oven. And that's when those inspections -- that's that other part of that compliance. Like, are the doors leaking? Are there emissions from charging, pushing emissions, soaking emissions, and things like that?
Q. And so, --
A. Even though pushing emissions aren't part of this report.
Q. I was going to say, you would agree though that the COMS data is showing improvement since 2016?
A. Yes. The 2016 order has demonstrated that there is improvement. U.S. Steel has met their requirements and their plans. They evaluated -- they had to evaluate three of the ovens to determine what is necessary to basically fix them. And so, they are on their way. They are doing it. They met their requirements, and so the COMS values have been improving.
Q. I know you weren't involved in the 2016 Consent Judgment, but you've had an opportunity to


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consume a little bit of time because I didn't have the opportunity to staple them prior to assembling them, or while assembling them, but I did provide a stapler. BY MR. WILLIS:
Q. If you'll turn to Number One?
A. Volume one?
Q. Volume One, Number One of the U.S. Steel

Corporation Hearing Exhibits.
HEARING OFFICER SLATER: Is this the Enforcement Order?

MR. WILLIS: Yes, sir.
HEARING OFFICER SLATER: Okay. I'm making
sure I'm looking at the right thing.
BY MR. WILLIS:
Q. Does this look familiar to you?
A. Yes.
Q. And you executed this order and issued it?
A. Well, I signed it. So, yeah, I enforced it. $I$ enforced it, and U.S. Steel executed it.
Q. And again, you felt comfortable with the remedies as being something that could be achieved?
A. Yes.
Q. Okay. Well, I will ask you -- I know that this was done under consultation with you and executed by you, but on Page 27 of that order -- it's under the
section of Total Penalty Assessment.
A. On Page 27?
Q. Yes. Number Four says, "Door leaks."
A. Yeah. Okay, yes.
Q. Okay. Now, it says, "Battery B shall reduce
-- and we're talking about door leaks -- shall be
reduced to be no more than 10 leaks per month based on
the yard equivalent reading for the Department's
Method 303 Contractor's Inspections."
If you could help me deconstruct, who are the
Method -- the Department's Method 303 Contractors?
A. Karamida.
Q. Karamida. And what are they inspecting?
A. They're basically there inspecting for the

NESHAP Requirements.
Q. Okay. And does ACHD Inspectors inspect for NESHAP Requirements?
A. They inspect for Article 21 Requirements.
Q. Okay. So, they're looking at two different things?
A. Yes.
Q. And just almost by definition, -- well, let me ask, do ACHD Inspectors make use of Method Nine?
A. Yes.
Q. Are you familiar with Method Nine?
A. Yes. I was certified for Method Nine for 11 years.
Q. Have you had the opportunity to do a Method Nine Inspection?
A. Yes, I've done many.
Q. Now, would that be with the county?
A. No. That would be with the State of Georgia.
Q. So, it's been some time since you've done it yourself?
A. It has. I mean, I started my career in emissions monitoring and testing, so I'm very

## familiar.

Q. How long did you do that?
A. For almost 10 years or 9 years.
Q. Okay. Are you familiar with Method 303?
A. Somewhat.
Q. Somewhat. Are you familiar with the yard equivalent reading?
A. I'm not that familiar.
Q. Okay.
A. I'm not the person to talk to about that.
Q. Okay. If you look at Number 12 in the booklet that you have in front of you, are you familiar with that document?
A. Yes.
Q. Could you describe that document?
A. Yeah. So, this is our Civil Penalty Policy. And so, this basically dictates how we determine calculating our penalties for violations of Article 21. Do you want me to go on about why this was developed?
Q. Well, -- well, yeah, if you could tell me why it was developed?
A. So, when -- in January of 2017, when I became the Environmental Deputy for the Enviromental Bureau you know, one of the things that $I$ was looking at at the time, and also our relatively new Solicitor, Mike Parker, was looking at at the time was we were looking at all of our enforcement procedures, and we both basically had the same concern. You know, we needed to be consistent.

We needed to have a very clear identification of the procedure for how we do enforcement. And so, I have five Bureaus, and I'm looking at all of those to make sure that they are consistent, that they are not arbitrary, and that they are, you know, indefensible. And so, you know, we looked at that.

And then I believe Mike had been assigned this project to come up with the new Civil Penalty Policy with Assistant Solicitor Jeff Daily. And so, -- and
we worked on this, and obviously the EPA's policy, as well as the DEP's policy, and formed this -- as well as Article 21 has very specific provisions on, you know, what needs to be considered for penalties. And so, those were all -- all of those were consulted by Jeff in putting this together.
Q. Do you know how long that process took?
A. It was a few months. I couldn't tell you for sure.
Q. Half a year or six months?
A. I --
Q. Five months or three months?
A. I really honestly don't know because Jeff
could have been started, you know, before I was aware of it, or before he started consulting me over the last few months of those provisions. I don't know when he actually began that, so -- this was quite a project. You know, it's a lot of effort to put something together like this.
Q. It says that it was -- that it was effective January 10th. Did it exist in any sort of form or a draft form before January?
A. Not that we were operating under.
Q. And there's an approval signature. Whose signature is that?
A. That's Dr. Karen Hacker.
Q. And she would have been the party who would have been approving a policy such as this?
A. Yes.
Q. Did this go through the Board of Health?
A. No.
Q. Did this go through -- I'm sorry.
A. I mean, this is a policy. And so, this is by, you know, direction of the Director. This -- and she approves all of the policies. And so, it's not a regulation.
Q. Okay. So, it didn't go through County Council?
A. No, it did not.
Q. Okay. Because it is a policy, do you know whether or not we must adhere to this policy in every instance?
A. We don't have to adhere in every instance.
Q. Do you know why that is?
A. Because it's not a regulation. A policy is direction, and a lot of times direction is based on interpretation.
Q. Do you know if this new policy is any more or less stringent than the prior Civil Penalty Policy?
A. I would argue that it's more stringent. I
think it's more consistent with our Article 21 Requirements, definitely with showing an emphasis on the protection of public health and repeat violations as well.
Q. And by repeat violations, how does that play into this policy?
A. So, there is a multiplying factor for repeated violations in the policy.
Q. So, the more violations you have, the higher your penalty will be?
A. Repeat violations -- well, obviously any -from any starting point, the more violations that you have will result in a higher penalty. But if you have those same violations repeating over the quarters, then that's going to increase as well.
Q. Just by chance, do you know the -- a regulatory maximum for a penalty?
A. It's $\$ 25,000$ per day per violation.
Q. In the development of this Enforcement Order, are you aware of any of the violations coming to \$25,000?
A. No, not even close.
Q. Okay. We'll move to -- if you'd go back to Number One and go towards the back of that document? It's going to be Page 19 of 24 .
A. Okay. What am I looking at 19 of 24 ?
Q. Page 19 of 24 , yeah. It's the --
A. One, Exhibit One?
Q. Yes. It's -- because there's two documents. There is the Enforcement Order, and attached as an exhibit is the 2016 Consent Judgment.
A. Am I looking at the 2018 or the 2016 ?
Q. So, it's even further back. It's about half way.
A. Am I looking at --

MR. PARKER: It's in the attachment -- excuse me. It's -- the attachment to the 2018 Order is the 2016 Order.

MR. KELLY: Okay. All right. The Re-opening Dispute. Okay, I see that.

BY MR. WILLIS:
Q. Okay. Do you see Paragraph B?
A. Yes.
Q. Now, could you read that for me?
A. "If, in one party's opinion, there is a
dispute between the parties with respect to
implementation of this Consent Judgment or the implementation of any provision of the this Consent Judgment, the party may send a written Notice of Dispute to the other party outlining the nature of the
dispute and requesting informal negotiations to resolve the dispute.

The parties shall make reasonable efforts to informally, and in good faith, resolve all disputes or differences of opinion regarding the implementation of this consent judgment. Such periods of informal negotiations shall not extend beyond 30 days from the date when the Notice of Dispute was received, unless the period is extended by written agreement of the parties. A dispute shall be considered to have arisen when one party receives the other party's Notice of Dispute."
Q. Would you agree that U.S. Steel has a dispute with respect to the implementation of this Consent Judgment?
A. They have not formally provided a dispute.
Q. Well, that's -- that's another question. I would say, is --
A. This appears --
Q. Would you -- would you agree that there is some dispute with respect to the implementation of the Consent Judgment?
A. Yes.
Q. Okay. But we did not receive a Notice of Dispute?
A. We did not receive a formal Notice of Dispute.
Q. Okay. We'll move to Section 16.
A. Okay.
Q. Are you familiar with this document?
A. Yes, I am.
Q. Can you identify this document?
A. So, this is the Annual Air quality Data

Summary. This gives the -- and this is for 2017.
This is the most recent report for which we have air quality data because -- keep in mind that there's a lag until 2018 is completed, we submit our data to EPA, and it's finalized. We don't have that data available.

So, 2017 is the most recent year for which we have data. So, this is an Air Quality Summary that
shows data for our monitoring network up through 2017
Q. Is there monitoring data with respect to the Liberty Monitor in here as well?
A. Yes, there is.
Q. Could you identify that please?
A. For which criteria pollutant?
Q. For SO2.
A. For SO2, that would be on Page 14.
Q. And correct me if I'm wrong, but it looks
like the numbers for the Liberty Monitor are substantially higher than that for the rest of the enumerated -- I'm presuming these are monitors; the Liberty, North Braddock, South Fayette, Lawrenceville, Avalon?
A. Yes.
Q. Are those all monitoring sites?
A. Yes.
Q. Okay.
A. You'll notice that all of the other monitors are well below the standard, and the Liberty Monitor continues to be above the standard.
Q. Do you have any information as to what would cause that monitor to be substantially higher than the other monitors?
A. So, SO2 is what's known as a source specific pollutant. You have criteria pollutants. So, other pollutants, like ozone, it's a regional issue. It takes a lot of contribution from over an area because it forms in the atmosphere, and so it's a regional issue.

SO2 -- so, when you have a non-attainment designation, which means that you failed to meet the standard, the area is subject to a plan to bring it into standard. SO2 is different. SO2 is source
specific. And so, what that means is either you have
a single source or a group of closely aligned sources
that are producing a lot of SO2 to violate that
standard.
And so, basically what this is telling us is that the Clairton Coke Works, which the Liberty Monitor is downwind of, is -- has a significant contribution to this monitor. And you'll see that this contribution is, you know, over 50 PPB in some instances. That's quite a gradient.
Q. Now, you say that U.S. Steel is a contributor. I don't see that anywhere in here.
A. That's not going to be in here. This report only gives you the data from the monitors. It's not going to say where the pollutant comes from or originates.
Q. So, it is possible that there are other sources that could combine with U.S. Steel to bring you to this number?
A. Well, there are two other U.S. Steel Plants, and, yes, there are some other -- there is other industry, but SO2 doesn't persist that long in the atmosphere. It quickly forms a secondary pollutant, which is a contribution to particulate matter as well. So, that's why the standard is source specific.
Q. Could you re- -- could you say that again? I didn't understand.
A. Starting with SO2 doesn't persist that long?
Q. Yeah, yeah.
A. It doesn't persist that long in the

## atmosphere.

Q. How long does it persist?
A. I couldn't tell you for sure. It's dependant on -- you know, it may be anywhere from a day to 40 days or so. It typically reacts with ammonia fairly quickly, so it doesn't persist that long in -- what it does is it reacts with ammonia quickly to form secondary particulate matter, believe it or not.

Of course, U.S. Steel Clairton Coke Works is also a source of ammonia as well. And so, you already have the two sides for that to happen. And so, obviously, it's not reacting that fast because we're still reading a lot of SO2 here.

Was that confusing?
Q. No, it's not. No, it's fine. I'm trying to determine whether -- whether and to what extent there would be another source in that area which would --
A. It's the largest source of SO2.
Q. -- impact that?
A. I mean, it'e -- there's nothing in the same
region, so --
Q. What about the municipal sewage treatment?
A. They're very, very minor compared to this.
Q. Are there some in the area?
A. And they don't -- okay. Now, you're starting to confuse your pollutants here because sewage treatment plants don't create SO2. They create H2S. Of course, when H2S is burned, it creates SO2. So, this is a measure of $\mathrm{SO2}$, and sewage treatment plants create zero SO2. They do create H2S, which is that rotten egg smell.
Q. So, H2S doesn't naturally convert to SO 2 in the atmosphere?
A. Oh, it can. Yes, it can.
Q. It can?
A. Yeah.
Q. So, there is some component that can be attributable to other sources based on the conversion from H2S to SO2? Is that a possibility?
A. It's a possibility, yes.
Q. Okay. That --
A. But that's very minor compared to the
emissions of H2S from -- from the Clairton Coke Works versus -- H2S and SO2 from the Clairton Coke Works versus the H2S from any types of sewage treatment
plants.
Q. That conversion from H 2 S to SO 2 , is that a catalytic process? Is there a required -- is something required to cause that to happen, or that a
A. Well, combustion.
Q. Okay.
A. But it -- naturally, H2S is not a stable
compound. It only persists in the atmosphere from 1 to 40 days, so --
Q. Okay.
A. And then it's just going to break down.

There are a lot of things in the atmosphere, secondary organics, that will, you know, combine and break it down.
Q. Okay. And with respect to particulate matter, is that also discussed --
A. Yes, it is.
Q. -- in this? Could you direct me to that?
A. Well, particulate matter -- fine particulate matter in 2.5 microns is on Page Eight.
Q. And again, correct me if I'm wrong, but it looks as though the Liberty Monitor is at the top of that list in terms of the annual standard -- against the annual standard for 12 micrograms per cubic meter?
A. Yes. And you'll see all of the other
monitors measuring fine particulate matter are below
the standard and are all continuing to trend downward,
with the exception of a minor increase in 2017.
But you'll see that the Iiberty Monitor has been increasing. The first year of increase, after decades of improvements, started in 2014, and there's a continued increase in the particulate matter. The Liberty Monitor is in a location directly downwind from the Clairton Coke Works.
Q. And as we've discussed already, Allegheny County is currently in non-attainment for SO2 and PM 2.5 --
A. Yes.
Q. -- in the same region of this Liberty

Monitor?
A. Yes.
Q. And the Liberty Monitor is primarily impacted by the operations at U.S. Steel?
A. Yes.
Q. Okay.
A. That's why it is located where it is located.
Q. I'm sorry, what's that?
A. That's why it is located where it is located.
Q. The monitor?
A. Yes.
Q. The monitor was specifically placed there
because of U.S. Steel?
A. From what I understand. I wasn't here when the monitor was located.
Q. Do you remember when --
A. But the SO 2 monitor location would be
required by EPA regulation to measure the facility at that location.

MR. WILLIS: Okay.
HEARING OFFICER SLATER: Let's go ahead and
take our mid-morning break.
MR. WILIIS: Do you want to take a break?
HEARING OFFICER SLATER: Yeah. Or are you --
is this a decent stop?
MR. WILLIS: We can take a break. I have,
like, three additional exhibits.
HEARING OFFICER SLATER: Okay. Yeah, let's
take a break and come back at about 10:50. It's around 10:40 now.
(The hearing recessed at 10:40 a.m, and
reconvened at 10:57 a.m.)
HEARING OFFICER SLATER: Let's go back on the record then.
BY MR. WILLIS:
Q. Okay. So, we left off at introducing
additional exhibits, and I wanted you to speak to a
few of them. This is one that opposing counsel does not have that I've just provided, and I will show you a copy. That will be Exhibit Four (sic). Okay. Are you familiar with that document?
A. Yes, I am.
Q. And what's it titled?
A. Charcoal Tube Sampling Results.
Q. Okay. And we've talked about some of the levels and concentrations of the things like Brex?
A. Yes.
Q. Does this give us any guidance as to the amount or form of BTEX that is coming up at those monitors?
A. It does. The last page in this presentation will give you an idea of that. This is a -basically, it's a VOC Toxics Study that was done at Avalon, which is a monitor that used to monitor the downwind emissions from the Shenango Coke Facility, and this is also -- and then the other -- the Liberty Monitor, which is located at South Allegheny High School, measures the downwind toxic concentration from the Clairton Coke Works.
Q. And to your recollection, do you recall the
operations that existed at Shenango prior to its closing?
A. It was -- it was a coking operation. They had one battery.
Q. They had one?
A. Yeah.
Q. Were you familiar with any of the enforcement activity with respect to Shenango?
A. I wasn't here at the time, but there was significant activity with shenango in the past.
Q. And why do you think that was, or why do you recall that being the case?
A. From what I understand, they were -- it was just that they were a problem child. Enforcement was the only way to get them to do what they had to do.
Q. Okay. And you mentioned that Avalon was the monitor that was picking up the -- primarily the emissions from that facility?
A. Yes. It is directly across the river, and it is located directly downwind of the monitor.
Q. Okay.
A. And modeling was used to locate where that monitor was as well.
Q. Okay. And in comparison and as we look at this, what are we learning here with respect to

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benzene, for example?
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A. So, if you look at the benzene value, these are two coke facilities in -- you know, located in populated areas. If you look at the maximum readings, the benzene from South Allegheny is 9.2 , and I believe that's PP- -- PPD. I don't think that's been converted yet to PPB.
Q. Pre-precipitation would suggest PPD?
A. Yeah.
Q. Is that correct?
A. Yes, it does. Yes, RPB. So, that's 9.25 parts per billion located at the Liberty Monitor monitoring the coke facility. The other coke facility -- and that monitor that's actually closer to Shenango was only measuring 1.6. Both of those values are to be -- you know, are values to be concerned about. But 9.2 versus 1.6 shows you that there's a significant gradient between the two monitors.
Q. Now, the distance to the facility, does that make a difference?
A. Yes, it does.
Q. How so?
A. Well, benzene is a -- it's a toxin, but it's also a fairly reactive compound, so it does really -you know, it's going to -- the farther you are,
obviously, it's going to disperse, and it's going to dilute. But also, benzene is fairly reactive as well. That's why it's toxic. I mean, it reacts to your cells, and it does a lot of damage.
Q. Okay. And what's the take-away from the numbers that we're seeing here? I mean, I'm not a scientist, but it looks as though the numbers at south Allegheny are significantly higher than that at Avalon; is that correct?
A. Yee. They're very significantly higher.
Q. Can you just qualify that? I mean, is it --
A. Well, I mean, I wouldn't want to be breathing it. But this is something -- we had an epidemiologist in our program before she -- she left and she was working on this and she was probably evaluating the health risk associated with that. That's something that we will look at at a future date as well, of what -- of how does that relates to this.
Q. Have you any understanding of the health risks with respect to benzene? I mean, do you --
A. It's just cancer. I mean, that's one of the worst, so --
Q. I'm sorry?
A. It's cancer. I mean, it's benzene. It's hard to look at these numbers because those values
that $I$ was just discussing is a maximum reading.
You'll see that the annual average is 1.2 PPB for the South Allegheny Monitor, which is at Liberty, and . 239 at the Avalon monitor.

I'm not an epidemiologist. I can't show you that. A cancer risk is a risk that's going to be a chronic exposure over 20 years, and so you can't infer what that risk is from this chart. However, you can see that those are elevated values.
Q. Is there a way --
A. What -- this does not give you is the EPA's isis levels of, you know, exposure and risk.
Q. Do you know what the levels would be for --
A. I really don't know.
Q. Okay.
A. I'm not an epidemiologist. Even if I knew what the levels were, I really wouldn't want to relate this to risk. It's just that these are elevated values.

One of the take-aways from this is that the Avalon Monitor says the maximum is 1.6 parts per billion. That's measuring -- that's not even ambient. That's elevated. That is another coke facility. And then the maximum reading at Liberty is 9.258 from that. Because when Shenango shut down, you'll see at
the bottom of this chart or table in 2016 the Avalon value was down to .487 . And so, that's probably closer to a background that would be associated with minor industrial and typical traffic transportation contributions to benzene.
Q. Is there anything that you can recall near the Avalon Monitor that would contribute to that, that number specifically, any other industrial facility?
A. As large as -- I'm not specifically familiar with -- I know there's a number of industrial facilities. As far as their benzene contributions, I cannot speak directly to that.
Q. Okay. I'm going move to the map. I think you -- we should mark that as ACHD One. HEARING OFFICER SLATER: The map, or -MR. WILLIS: Yeah. No, the study. HEARING OFFICER SLATER: Okay.
BY MR. WILLIS:
Q. We're moving onto ACHD Two. Does this look familiar to you?
A. Yes. That's the City of Clairton and the Clairton Coke Works.
Q. And in relation to the City of Clairton, if you were to estimate, what's -- what's the size of that facility? I know it's a satellite image, but

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could you roughly estimate the size of what you're
seeing there?
    A. I know, top to bottom, the facility is
pushing three miles. That's -- you know, don't take
me at my word for that, but I know it's a very large
facility, and it covers over a very large area. I
know it is North America's largest coking facility.
    Q. With how many batteries?
    A. Ten batteries.
    Q. Okay. And just to circle back, with respect
to our Enforcement Order, the worst case scenario, how
many batteries would have to go off line?
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A. Two.
Q. Out of 10 ?
A. Out of 10 .
Q. Okay. We're going to go with ACHD Three. Do you know who Jim -- James Thompson is?
A. He was my predecessor. He was the previous Deputy Director of the Environmental Health Bureau prior to my -- my position.
Q. Okay. Do you know what we're looking at here? I know it says, "H2S NRV," but do you know what this relates to?
A. Yes. So, from what I understand -- I wasn't here during this time, and you can ask Jayme Graham
when you question her specifically about how this came about. So, what this is -- these are modeling results that were submitted by U.S. Steel. Apparently, there was -- the Allegheny County Health Department attempted an enforcement.

I don't know if it was an order or if it was just a penalty against U.S. Steel for violations at the H2S monitor at Liberty. And in response, U.S. Steel provided this modeling, dispersion modeling, -- just the outputs, not the inputs -- showing from their modeling demonstrating that the Clairton Municipal Sewage Treatment Plant had a more significant impact than U.S. Steel.
Q. Now, as an engineer, as a scientist, and as somebody who has worked in this area for many years, does the data on this sheet seem sufficient to you to satisfy your understanding of what H2S impacts are?
A. No, it doesn't. It really doesn't. When I received this -- at the time, you know, there were some concerns about complaints for H2S. Again, that's that rotten egg smell. And before I had a chance to talk to my monitors and even the water pollution control people about, you know, the impacts of these facilities, you know, this was all I had at the time.

Because I had asked our Planning people, "What do
you have on the emissions?" and they had sent me this without sending me the emissions inventory data. And then I got an opportunity to review the emissions inventory data, and this -- it doesn't pass the eyeball test that this 15 pound per hour of SO 2 emissions from, you know, this facility compared to the contributions from Clairton Coke Works. It just does not make sense.
Q. Okay. All right. And you've reviewed the emissions inventory for the U.S. Steel at Clairton?
A. It's been a long time.
Q. It's been a long time?
A. Yeah. I couldn't give you specific numbers about the emissions data.
Q. Okay. To your understanding, does that emissions data reflect violations to opacity standards? Are those included in the emissions data?
A. No. You're talking about two different things. So, the opacity standard, that's --
Q. Well, any violations? Does that contemplate any violations of exceedances?
A. The opacity standard?
Q. Yeah.
A. For --
Q. For the emissions inventory. Let me take it
back one --
A. Well, you're talking about two different
things here, so --
Q. Well, let me take it back one step. The emissions inventory does contemplate leaks for the doors; am I correct?
A. There might -- there are probably some
emission factors that contemplate a specific amount of leaks subject to the rule. And so, when you develop the rule, and you -- those emissions that you use in the SIP development are assuming that you're meeting -- is that what you're talking about?
Q. Yes.
A. They're assuming that you're meeting that rule. And so, the regulations say you're allowed so many leaks. And so, that's what the regulation -that's what you set. And so, when you do the emissions modeling, you take into consideration how many of those leak. But if there are more than that, the modeling and the emissions inventory doesn't take that into consideration if you're violating it.
Q. Okay.
A. Does that make sense?
Q. Yeah, it does. And that emissions inventory data is, as you mentioned earlier, used as a part of

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the SIP process?
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A. It's the starting point.
Q. The starting -- I'm sorry, the starting point?
A. Yes, the starting point.
Q. And to the extent that it does take into consideration the fact that there is a leak, does it take into consideration the quality of the leak, which is to say, does it take into consideration duration of a leak or opacity of a leak?
A. I know of no way that that could be possible.

I mean, a leak can be just a whisp of smoke or half a door open. I mean -- so, no. There's -- from what I understand, there's -- you know, I'm not familiar enough with that process, but it does not make sense that they would take the quali- -- well, the quantity of the leak is what you're getting at, correct?
Q. Yeah, yeah.
A. Yes.
Q. Well, quantity and quality, I guess.
A. Yeah.
Q. The fact that there's a leak does not --
A. Yes. It's, like, binary. It's yes or no.
Q. I see.
A. And the regulation says you're allowed leaks,
and then that's where the emissions factors will be subject to, assuming that you're meeting the rule.

MR. WILLIS: Okay. I have no further questions.

HEARING OFFICER SLATER: Mr. Dausch, do have you some questions for Mr. Kelly?

MR. DAUSCH: I do.
HEARING OFFICER SLATER: Actually,
Mr. Dausch, before you get to those questions, is there any objection to the admission of ACHD One, Two, and Three, or were those the same as identified in ACHD prehearing, one through --

MR. DAUSCH: There's no objection.
HEARING OFFICER SLATER: No objection?
MR. DAUSCH: No, sir.
HEARING OFFICER SLATER: Okay. ACHD One,
Two, and Three are admitted.
MR. DAUSCH: And should we mark the Joint
Exhibits One and Two? I'm not sure if we actually marked them.

HEARING OFFICER SLATER: Yeah. Let me mark those. I forgot which one -- is the one that's only one page Joint Exhibit --

MR. DAUSCH: I'm not sure it matters which one is One and Two.

HEARING OFFICER SLATER: Okay.
MR. DAUSCH: Just as long as they have a number.

HEARING OFFICER SLATER: All right. I'll mark the one that's only one page as J1, and then the one that's two pages can be J2. So, J1 and J2 are admitted.

MR. DAUSCH: And just for the record, those are two -- One and Two are emails that are communications between counsel regarding stipulations in the hearing.

Mr. Slater, can I proceed?
HEARING OFFICER SLATER: Yes, you may. CROSS-EXAMINATION
BY MR. DAUSCH:
Q. Mr. Kelly, the Clairton Plant is subject to
the most stringent regulations in the entire country?
A. Yes.
Q. And those regulations include County

Regulations?
A. Yes.
Q. They also include Federal Government

Regulations?
A. Yes.
Q. And the county enforces both of those, both
the State -- or both the County and the Federal Regulations?
A. Yes.
Q. And those regulations that you mentioned
earlier are in a permit?
A. Yes.
Q. Title Five Operating Permit is a permit that would apply to the Clairton Plant?
A. Yes.
Q. That's a comprehensive document that would have both the Federal and the County Regulations in it, correct?
A. Yes.
Q. And one of the things that the County does is it uses its enforcement section to enforce those regulations?
A. Yes.
Q. And that's what we did -- or that's what was done to put us in this hearing, correct?
A. Yes.
Q. There was an Enforcement Order, correct?
A. Yes.
Q. And that Enforcement Order includes a
monetary penalty?
A. Yes.

Q. It also includes a corrective action?
A. Yes.
Q. And the corrective action is a little bit
different because it requires U.S. Steel to meet certain things that are in the order, correct?
A. Yes.
Q. And those certain things are things that the County came up with and put in the order?
A. Well, we didn't come up with those. I mean,

Article 21 gives us a pretty broad discretion, so I wouldn't determine that we just came up with that.
Q. You mentioned a door leak standard that's in the Enforcement Letter?
A. Yes.
Q. The County came up with that door leak standard. It's not in Article 21, correct?
A. You are correct.
Q. The County came up with the baseline calculation that you mentioned earlier, correct?
A. Yes.
Q. The Enforcement Order includes violations of fugitive emissions sources, correct?
A. Yes.
Q. But not all of them at the batteries, right?
A. Yeah. I believe -- I'm not sure. Soaking
and traveling and pushing are not part of that.
Q. Right. And so, when you were explaining to Mr. Slater earlier with the slices of bread --
A. Yes.
Q. -- and one door opens and coke is pushed out, --
A. Yes.
Q. -- that's pushing emissions, correct?
A. That is. Those are pushing emissions.
Q. Pushing emissions -- there are no violations of pushing emissions in the Enforcement Order, correct?
A. Yes. Wait a minute. Yeah, I believe so.
Q. I'm correct?
A. Yeah. That's specific. So, pushing and soaking, I believe, are specific, but they are not part of this case.
Q. You also mentioned battery stacks?
A. Yes.
Q. Okay. Each battery -- there are 10 batteries at Clairton?
A. Yes.
Q. Each battery has a stack that's specific to the battery?
A. Yes, for combustion emissions.
Q. All right. And the stack is the large chimney structure that you could see if you were driving down the road?
A. Yes.
Q. Okay. And those stacks you have described are Continuous Opacity Monitors?
A. Yes, COMS, Continuous Opacity Monitors.
Q. And that's a piece of equipment that takes a recording on almost a second-by-second basis, correct?
A. Yes.
Q. Okay. And it takes a recording, and it compares the data that's captured by the equipment to a standard that's in Article 21 or in a Federal Regulation, correct?
A. Yes.
Q. Okay. And there are no battery stack violations in the Enforcement Order, correct?
A. That's correct.
Q. Okay. You mentioned that earlier this year the Department came up with a new Penalty Policy?
A. Yes.
Q. This was a policy to make it more clear what its procedures would be for enforcement actions, correct?
A. Yes.
Q. It was significantly more stringent than what the Department had been doing in the past, correct?
A. It depends on the scenario. Because I know when Jeff had created the penalty policy, they ran the policy through all the previous years' penalties, and some of those penalties would have actually reduced in value.
Q. The testimony earlier was that the goal was to be more stringent; is that correct?
A. The goal was to be more specific to Article 21 and protective of public health.
Q. And was the goal to be more stringent?
A. If that's what's necessary to protect public health, yes.
Q. Do you, on occasion, make presentations to the Board of Health?

## A. Yes.

Q. And have you done that with respect to this Penalty Policy?
A. Yes. I gave an update on the Penalty Policy.
Q. And when you give updates to the Board of Health, do you try to be honest?
A. Yes.
Q. Do you try to be accurate?
A. Yes.
Q. Do you recall earlier this year giving the update on the Penalty Policy?
A. Yes.
Q. Well, let's look at that document. Could you
look at Exhibit Two please?
HEARING OFFICER SLATER: This is U.S. Steel
Exhibit Two?
MR. DAUSCH: This is U.S. Steel Exhibit Two. HEARING OFFICER SLATER: Okay.
BY MR. DAUSCH:
Q. And on the seventh page of this document, it
should be on the right-hand side, there's a Section E.
A. There are no page numbers, so --
Q. Right.
A. Okay.
Q. If you look at the bottom right of the page, you'll see, "E, Update of Air Quality."
A. Yes.
Q. All right. And so, it says, "E, update of Air Quality Civil Penalty Policy," correct?
A. Yes.
Q. And we looked at it earlier. The Penalty Policy became effective on January loth of 2018, correct?
A. Yes.
A. Yes.
Q. Obviously, this new Penalty Policy wasn't effective in that quarter?
A. No, it was not.
Q. The second quarter that's at issue in this penalty is the fourth quarter of 2017 , correct?
A. Yes.
Q. The new Penalty Policy was not in effect when that fourth quarter of 2017 occurred; is that fair?
A. That is fair.
Q. Okay. The third quarter that's at issue in this enforcement action is the first quarter of 2018, correct?
A. Yes.
Q. And when that quarter started, the Penalty Policy was not effective; is that correct?
A. When it started, yes.
Q. Okay. Do you recall telling the Board of Health that one of the purposes of the new Penalty Policy was to increase deterrents?
A. Yes.
Q. And the idea is you make a Penalty Policy
publicly available so that companies understand what kind of penalties could exist in certain situations, right?
A. Yes.
Q. And you make it publicly available, so that the regulated industry has advanced notice of what can happen in an enforcement action?
A. Yes.
Q. Obviously, if a Penalty Policy is not in effect, the regulated industry wouldn't have that advanced notice; is that fair?
A. That is fair. But Article 21 was also in effect, and these are violations of Article 21.
Q. Well, you also told the Board of Health that you were trying to create increased deterrents for future violations, correct?
A. Yes.
Q. And at this point, we were into the last quarter of three quarters that are at issue in this case?
A. Yes, that is correct.
Q. Okay. And the Department still used this new 2008 (sic) Penalty Policy for the Enforcement Order
that's in this case?
A. 2018 .
Q. The 2018 Penalty Policy?
A. Yes.
Q. Correct?
A. Yes.
Q. One of the things that was changed in this new Penalty Policy that didn't exist for a majority of the quarters that are at issue, is the Department changed its violation target; is that correct?
A. Yes.
Q. Okay.
A. Well, that's an interesting way to
characterize it, so --
Q. Well, didn't you characterize it that way for the Board of Health earlier this year?
A. I did.
Q. Okay,
A. It's not spelled out in the policy, but yes.
Q. And what you told the Board of Health is that the new Penalty Policy has a violation target of 99 percent compliance, correct?
A. Yes.
Q. And before that, the prior policy that the Department had looked for a violation of target

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between }85\mathrm{ percent and }95\mathrm{ percent?
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A. Yes.
Q. That's a big increase?
A. Yes.
Q. It's a big increase to go and say to the regulated public, "We're looking for 85 to 95 percent compliance," and then one day, "We're looking for 99 percent compliance."

Is that fair?
A. It depends on what you mean by fair. Again, Article 21 has always been in effect. So, if you're just assuming that you can violate to a certain amount and never be in -- do you see what I'm saying? I mean --
Q. I don't, sir.
A. All right.
Q. What I'm asking you about is violation targets that you told the Board of Health about.
A. Yes. I think it's completely fair because apparently our violation targets before weren't working because this monitor is -- continues to decrease in compliance.
Q. And so, let's say we use the violation target that existed in 2017 when two of the three quarters at issue occurred.
A. Yes.
Q. U.S. Steel is substantially above those violation targets?
A. I couldn't tell you for sure what those numbers were. I'm not involved in the calculation of those, so I can't say yes or no, they were significantly above those violation targets.
Q. Sir, you signed this Enforcement Order?
A. I did sign this Enforcement Order.
Q. And you don't know U.S. Steel's compliance percentage for the three quarters that are at issue?
A. Well, I do. I have the numbers, but I'm not saying -- I know what their compliance percentages were for the quarter -- for what this was. I don't know if it was significantly above, you know, what we were previously doing.
Q. Let's not say significantly.
A. Yeah.
Q. We can agree that they were above the 85 to 95 percent range that was the violation target, correct?
A. That's across the facility, yes. But we have certain instances of Article 21 where the violations were below that.
Q. And so, across the facility, U.S. Steel was
above the violation target that existed in the third quarter of 2017?
A. Yes.
Q. It was above the violation target that

## existed in the fourth quarter of 2017?

A. Yes.
Q. And it was above the violation target that existed when the first quarter of 2018 started?
A. Facility wide -- so, we were looking for 99 percent, and facility wide it was, what, 98.152. So, no.
Q. When the first quarter of 2018 started --
A. The first quarter of 2018 started --
Q. The new Penalty Policy wasn't effective, correct?
A. The Penalty Policy becomes -- I mean, when we calculate the Penalty Policies, it's effective the day we calculate those policies.
Q. That wasn't my question, sir.
A. Okay.
Q. When the first quarter of 2018 started, that Penalty Policy wasn't in effect?
A. Yes, when the quarter started.
Q. It was not in effect, correct?
A. Yes, it was not in effect on January lst.
Q. And you told Mr. Willis that the public didn't have any advanced notice of a draft of that that policy before it became effective?
A. No.
Q. And so, the first time that it became effective was after the third of three quarters started in this case?
A. Yes.
Q. Okay. When that first quarter of 2018 started, the Department's violation target that you told the Board of Health was between 85 and 95 percent; is that correct?
A. Yes.
Q. And the Department calculated U.S. Steel's compliance for the first quarter of 2018 , didn't it?
A. Yee.
Q. Above 98 percent?
A. Yes, for the entire facility.
Q. Can we agree that above 98 percent is
significantly above the 85 to 95 percent target that existed at the beginning of 2018?
A. We can agree that those numbers are larger, yes.
Q. You told the Board of Health that this new and more stringent Penalty Policy that was being

created at the beginning of 2018 was going to increase penalties by 60 percent on average?
A. On average over the calculations for the year before.
Q. One of the things that the Board of Health wanted to know when you told them about this 99
percent compliance range that had changed was why not 100, right?
A. Yes.
Q. And you told them that nowhere is 100 percent compliant?
A. Yes.
Q. And that's a fair statement?
A. Yes.
Q. You have a mechanical engineering background, correct?
A. Mmhmm (affirmative). You can have
breakdowns, yes.
Q. And you understand that the U.S. Steel's Clairton Plant has thousands of inspections and observations each day?
A. Yes.
Q. I mean, there are hundreds of doors, there are hundreds of lids, there are hundreds of off-takes that are all inspected?
A. Yes.
Q. Right?
A. There are 6300 emission points.
Q. Sixty-three hundred emission points that are all equipment, correct?
A. Yes.
Q. And equipment can break down?
A. Yes.
Q. Okay. And that's why nowhere is 100
compliant; is that correct?
A. Yes.

HEARING OFFICER SLATER: So, did you say 63,000 emissions points or 6300?

MR. KELIY: Sixty-three hundred.
HEARING OFFICER SLATER: Sixty-three hundred, okay.

MR. KELLY: Approximately.
BY MR. DAUSCH:
Q. I want to talk a little bit about the baseline calculation that you were explaining earlier, okay?
A. That $I$ was explaining?
Q. Did you talk about the baseline calculation in the Enforcement Order and how it works?
A. Yeah. The baseline was the compliance rate
for 2018. I didn't talk about the calculation. I just said, specifically, it was --
Q. Let's talk about the baseline then?
A. Okay.
Q. The Enforcement Order includes a requirement
that first the Department calculated a baseline calculation?
A. Yes.
Q. Okay. And what the Department did was it looked at the entire compliance rate for all of the batteries at Clairton for the first quarter of 2018?
A. Yes.
Q. Okay. And what it did was it looked not just at the fugitive emissions points that are at issue in the Enforcement Order, but all of the different emission points, correct?
A. Yes.
Q. And so, the baseline calculation includes things like pushing where there are no violations in the Enforcement Order, correct?
A. Yes.
Q. That calculation includes things like
soaking, where there are no violations in the Enforcement Order?
A. Yes.
Q. Okay. Half of that baseline calculation includes battery stack compliance, correct?
A. Yes.
Q. And that's the COMS that we talked about earlier?
A. Yes.
Q. There are zero battery stack violations in the Enforcement Order, correct?
A. The 2018 Enforcement Order, correct.
Q. Yes. Battery stack and COMS are 50 percent of the baseline in the Enforcement Order?
A. Yeah, approximately 50 percent.
Q. Okay. And the baseline calculation the Department came up with was over 98 percent?
A. Slightly over 98 percent.
Q. Okay. Baseline is an important number in the Enforcement Order, correct?
A. Yes, it is important.
Q. Because the way the Enforcement Order works is you take this baseline calculation of above 98 percent, and then U.S. Steel has to beat that in the first quarter of 2019?
A. Yes.
Q. And then whatever it had in the first quarter of 2019, it has to beat that again in the second

## quarter of 2019?

A. Correct.
Q. Okay. And if it doesn't do either of those, it has to hot idle two batteries?
A. Yes.
Q. When the Department issued the Enforcement

Order, it didn't even know what the baseline
calculation was, did it?
A. I couldn't tell you for sure because I wasn't the one who calculated that, so --
Q. Well, you signed the Enforcement Order, right?
A. I did, but --
Q. And when you signed it, you didn't know what the baseline calculation was?
A. Baseline was the performance from 2018 with a significant number of violations. That was the baseline.
Q. Sir, my question was very simple.
A. Yeah.
Q. When you signed the Enforcement Order, …
A. Yes.
Q. -- you didn't know what the baseline calculation was?
A. Not with the calculation.
Q. Occasionally, the Department gets media inquiries; is that fair?
A. Yes.
Q. Something like an Enforcement Order that includes a million-dollar penalty --
A. Yeah.
Q. -- is something that would cause these media inquiries?
A. Yes.
Q. And that happened in this case, and there's media here today?
A. Ye日.
Q. Okay. Would you look at Exhibit 54 in your second binder? And, sir, because this is an email chain, we're going to start at the back and work our way forward because that's how the email chain works. Okay?
A. Okay.
Q. Do you see the first email that's from August 28 th of this year?
A. Yes.
Q. August 28 th would have been about two months after the Enforcement Order was issued, correct?
A. Yes.
Q. And this email was from Don Hoppe. Do you
see that?
A. Yes.
Q. Mr. Hoppe is a reporter for the Post Gazette?
A. Yes.
Q. The email is to Ryan Scarpino, correct?
A. Yes.
Q. Mr. Scarpino handles media inquires for the Allegheny County Health Department?
A. Yes. He's the Public Information Officer.
Q. Okay. Mr. Hoppe says that U.S. Steel is claiming that it has a higher than 98 percent compliance rate, right?
A. Yes.
Q. And he says, "If so, that raises the question of how a facility in compliance 98 percent plus of the time deserves a one million dollar fine?"

Do you see that question that he asked?
A. Yes.
Q. And then if you look, Dr. Hacker had an internal communication --

MR. WILLIS: Which I'm going to object to at this point. That's an internal communication including myself as counsel, so all subsequent communication including me is subject to attorneyclient privilege.

MR. DAUSCH: You cannot just include yourself
on an email chain as an attorney and say it's
attorney-client privilege. This is a media inquiry --
MR. WILLIS: I have --
MR. DAUSCH: -- and this isn't legal advice and there isn't a single attorney response on this entire email chain.

MR. WILLIS: It is being presented to me for attorney -- for legal advice.

MR. DAUSCH: And there is not a single piece of legal advice given in this entire email chain.

MR. WILLIS: Irrespective of that, it is included to me for presentation of -- of legal advice. Whether I give it is really immaterial. It's information being provided to counsel for legal advice. And, in fact, it mentions legal advice.

HEARING OFFICER SLATER: Mr. Dausch, did you have a response to that?

MR. DAUSCH: Yeah. There's not a single piece of legal advice. This is a business inquiry about public relations. Dr. Hacker responds and asks two non-attorneys, Mr. Kelly and Ms. Graham, for their response. She says, "We do need to clarify what Don Hoppe's asking."

MR. WILLIS: Excuse me. Before we go into an

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on-the-record discussion about what's actually being
said, I have to assert attorney-client privilege to
respect to the responses and correspondence after the
correspondence from Don Hoppe to Ryan Scarpino.
    MR. DAUSCH: Where is the attorney-client
communication in this email chain?
    MR. WILLIS: It is being communicated to me,
as counsel, for the purpose of provision of legal
advice. Regardless of whether or not I provide that
advise, they are reaching out to me, as counsel, to
provide legal advice.
    HEARING OFFICER SLATER: All right.
    MR. DAUSCH: Mr. Slater, that's not the
attorney-client privilege rule in any jurisdiction.
    HEARING OFFICER SLATER: All right. Let me
--
    MR. WILLIS: Actually, it's in the Federal
Jurisdiction, so --
    HEARING OFFICER SLATER: All right. Let me
-- I understand your arguments. Let me just take a
look at these. Give me one moment.
    All right. I'm going to overrule Mr. Willis'
objection, but I will take it as to the weight of
whatever is being said on behalf of the Health
Department.
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$\square 114$
MR. WILLIS: Sure.
BY MR. DAUSCH:
Q. Mr. Kelly, let me back up and reorient us.
Mr. Hoppe asked the question, "It raises the question
of how a facility in compliance 98 percent of the time
deserves a one miliion dollar fine?"
Do you recall that?
A. Yes.
Q. And Dr. Hacker would be your boss?
A. Yes.
Q. And she said, "We do need to clarify this,"
right?
A. Yes.
Q. And she asked specifically for you and Ms. Graham's advice on this, correct?
A. Yes.
Q. And your response, two months after the Enforcement Order was issued, "Although they have not been specific about their 98 percent claim, we believe that it's in reference to the opacity limits subject to the 2016 Consent Order." Is that what you said?

## A. Yes.

Q. And so, at this point, two months after the Enforcement Order was issued, you thought the 98 percent only applied to the battery stacks?
A. I wouldn't characterize it as that because, again, I do a lot of enforcement. And so, at the time I was performing this evaluation, there was a lot of numbers presented over a large number of days. So, I can't say for absolute certain, and I told you this before, whether or not $I$ was fully familiar with that 98 percent. I was --
Q. Let me back up, Mr. Kelly. Your sentence is, "We believe that it's in reference to the opacity limits subject to the 2016 Consent Order."
A. Yes.
Q. Right?
A. Yeah.
Q. That means the battery stacks?
A. Yes.
Q. Okay. So, you thought the 98 percent related to the battery stacks?
A. Yes, incorrectly.
Q. And you thought that two months after the Enforcement Order was issued?
A. Yeah.
Q. Right?
A. Yes.
Q. Okay. You didn't think the 98 percent applied to all of the batteries -- all of the
emissions points?
A. No, I wasn't sure.
Q. Okay.
A. And I think this demonstrates that lack of certainty.
Q. Right. And after Dr. Hacker had said, "We need to clarify this," the County figured out that U.S. Steel was right?
A. Yeah. And so, why don't you read my next one where it says, "Where an obscures --
Q. Excuse me, sir.
A. Yes?
Q. Okay.

MR. WILLIS: No, let him finish his answer.
HEARING OFFICER SLATER: Yeah, let Mr. Kelly finish.

MR. KELLY: You're cherry picking this, so -I mean, come on.
"So, it looks like for the entirety of the plant may be 98 percent, which obscures problems at poorly performing batteries."

We can break down compliance per battery per standard, and that is the evaluations that $I$ was using during the creation of this order, was the per battery compliance per standard.

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BY MR. DAUSCH:
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    Q. And so, after Dr. Hacker said, "We need to
    clarify this," and you determined that the 98 percent
did apply --
A. Yes.
Q. -- to all of the battery points, you didn't clarify this, correct?
A. What do you mean by, "Didn't clarify this"?
Q. Well, you told Mr. Hoppe, "It's inappropriate to comment."
A. Well, that's true because by that time the
appeal had been -- does that make sense? I mean, the appeal had been filed, and so I can't really comment back to Don Hoppe about that, so --
Q. After Dr. Hacker said, "We need to clarify this"?
A. She told me -- but then obviously -- you know, we would need to step back and look at the situation before we respond to media and see where we are. And the reality is, we're under appeal, and we do not comment on ongoing litigation or legal matters
Q. I'm going to switch topics and talk a little bit more about the battery stack compliance and the COMS. That's subject to a 2016 Consent Judgment, correct?
A. Yes.
Q. That was entered in the Court of Common Pleas of Allegheny County?
A. I was not part of that, so I really can't comment on how that provision came about.
Q. You don't know where the Consent Judgment was entered?
A. No, I don't. I wasn't part of that. I didn't draft it. I wasn't part of signing it. I was not even in this position at the time.
Q. You do know that it relates to battery stack compliance though, right?
A. Yes.
Q. Okay. And U.S. Steel has two separate requirements that -- or standards that relate to battery stacks, correct?
A. Yes.
Q. There's a 60 percent opacity standard and a 20 percent opacity standard?
A. Yes.
Q. Is that right? The 60 percent opacity
standard has never been a problem at clairton?
A. I don't know if it would characterize that,
so -- has never been a problem.
Q. It's always had a high compliance rate; is
that correct?
A. I don't know what their compliance rate is for the 60 percent.
Q. Well, they've never needed to improve the 60 percent; is that fair?
A. It may be. But it was subject to the order, so apparently there was some type of consideration there. Those considerations, that I wasn't a part of, -- but it was part of that order.
Q. Let's look at U.S. Steel's Exhibit 29.
A. In which binder?
Q. The first binder.

HEARING OFFICER SLATER: It's the first one. BY MR. DAUSCH:
Q. And I want to point you to the document that's Bates Labeled ACHD 12868. You'll see that at the bottom right-hand corner.
A. Which number tab?

HEARING OFFICER SLATER: Twenty-nine.
MR. KELLY: Okay.
HEARING OFFICER SLATER: I'm sorry, can you
say the Bates Number again?
MR. KELLY: Yeah, it's 12868.
HEARING OFFICER SLATER: Okay.
MR. KELLY: In the bottom right-hand corner.

BY MR. DAUSCH:
Q. Are you there, sir?
A. Yes.
Q. And this is an email chain between you and Dr. Hacker, correct?
A. Okay. I see that, yes.
Q. And Dr. Hacker is your boss?
A. Yes.
Q. And in this, you're discussing the two standards that apply to battery stacks, correct?
A. Yes.
Q. The 60 percent and the 20 percent?
A. Yes.
Q. Do you recall, I just asked you if U.S. Steel has always had a high compliance rate with the 60 percent, and you said you don't know, correct?
A. Yes.
Q. You knew earlier this year when you were having a private email communication with Dr. Hacker, correct?
A. I had to -- I didn't know at the time. I had to go ask somebody at the time to determine what that was because, again, this was from the 2016 Consent Order, which I was not involved in. And so, when there were issues with that and questions have to be
asked of me, I have to go to our Enforcement Staff to determine what this value is. It's not something that I knew before she asked. This was a response to that. I've moved on, and so apparently I did not retain that information very well.
Q. Okay. Now reading this, --
A. Yes.
Q. -- will you agree --
A. Yes.
Q. -- that they've always had a high compliance rate with the 60 percent?
A. Okay. Yes, a high compliance rate with the 60 percent.
Q. Okay. And you also told Dr. Hacker that the 60 percent has never been a problem and didn't need to improve?
A. Well, characterizing this is just saying that the 20 was one of the problems. So, are you -- you're interpreting that as it doesn't need to improve?
Q. No. I'm asking if you said that?
A. What it says here is, "The 60 percent
standard has always shown a high compliance rate since it's much harder to violate."
Q. Could you look at the page on the left, sir?
A. Okay.
Q. Do you see the second email from the bottom?
A. Yes.
Q. "Sixty percent can go either way."
A. Yeah.
Q. "It doesn"t show an improvement, but it also shows that --
A. Yeah.
Q. -- it was never really much of a problem and didn't need to improve." Correct?
A. Yes.
Q. Okay. So, you had that knowledge earlier this year?
A. Yes.
Q. You just forgot that?
A. Yes.
Q. The 20 percent is what's at issue in the 2016 Consent Judgment?
A. Ye日.
Q. And that's because the 60 had always been high compliance?
A. Well, apparently so. Again, I wasn't a part of that.
Q. And there's been major improvements since the 2016 Consent Judgment with battery stack opacity, correct?
A. Yes.
Q. And battery stack opacity, although it's part of the 2016 Consent Judgment, it's also part of the baseline calculation?
A. As a performance metric, not as a punitive measure.
Q. Right before this Enforcement Order was issued, you questioned whether it made sense to use battery stacks and COMS as part of the baseline; do you recall that?
A. At what time, sir?
Q. Right before the order was issued.
A. Yeah. What do you mean? So, what is your evidence that I questioned that at the time? I had questioned it, yes.
Q. Yeah.
A. But where is your documentation that $I$
questioned that?
Q. Starting with your recollections, sir, do you recall right before the enforcement was issued, you questioned whether the Department should use battery stack opacity as part of that baseline?
A. I didn't -- I don't recall questioning that.
Q. Are you saying you didn't?
A. No. I don't recall. I don't think I would
question that at all, so --
Q. All right. Well, let's look at Exhibit 20.
A. As long as it doesn't -- my -- I was very
clear, as long as it doesn't conflict with the 2016 Enforcement Order.
Q. Can you look at Exhibit 20, sir?
A. Okay.
Q. And the way to do this that would be the easiest would be to look at the second page of Exhibit 20 with the Bates Label 10591. Do you see that?
A. Yes.
Q. And if you see, at the very bottom you sent an email on June 26,2018 saying that you offered some comments below.
A. Yee.
Q. Okay. Let's look at your comments, which are on Page ACHD 10593. Do you see the third full
paragraph on this page that starts with, "Within 60 days"?
A. I'm reading it. Okay, yes.
Q. And do you see your comment where you said, "Should we include opacity monitors," which is battery stacks, "since they're part of the consent decree?" Does that refresh your recollection?
A. This is a cumulative document, so I could not

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say for sure if that was me who put that in there.
But obviously, as the Bureau Chief, I would have
definitely asked that question because what are --
what are the consequences of including the COMS as
part of that? But U.S. Steel wasn't being penalized,
and so, obviously, the Council discussions resulted in
the fact that it was not an issue.
    Q. Sir, help me understand. Is your testimony
that you did or you didn't question use of COMS or
battery stacks in the baseline?
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A. Okay. Let's go with I questioned whether or not that was appropriate, yes.
Q. Okay. And you questioned whether or not it was appropriate because it was also in the 2016 Consent Judgment?
A. Yes.
Q. Okay. That Consent Judgment is ongoing?
A. Yes.
Q. And there are no battery stack violations in the Enforcement Order?
A. You're correct. There's no -- and that answered that question correctly right there because there were no -- there was not penalties associated with the COMS.

MR. DAUSCH: Mr. Slater, what time do you
plan to break? I'm about to get into a new area.
HEARING OFFICER SLATER: We can go until
probably 12:15 or 12:30.
MR. DAUSCH: Okay.
BY MR. DAUSCH:
Q. I want to switch topics, sir, and ask you about the B Battery door Leak Standard that's in the Enforcement Order?
A. Okay.
Q. You mentioned that a little bit earlier on your direct testimony?
A. Yes.
Q. What specific pollutants were the -- was the Department trying to regulate with that new standard?
A. Visible emissions, air toxics, particulate matter, and SO2.
Q. And air toxics, that's the same thing as hazardous air pollutants?
A. Yes.
Q. There's a rule making process that occurs before a regulation becomes part of Article 21 , correct?
A. Yes.
Q. You're familiar with that process?
A. Yes.
Q. Rules are developed, correct?
A. Yes.
Q. They're sent to a regulatory subcommittee?
A. Yes.
Q. They're sent to an advisory committee?
A. Yes.
Q. They're sent to the Board of Health?
A. Yes.
Q. There's public comments?
A. Yes.
Q. There's public hearings?
A. If necessary.
Q. They're sent to County Council?
A. Yes.
Q. There's an involved process before a rule
comes from being proposed to final, correct?
A. Yes.
Q. And that didn't happen with the B Battery Door Leak Standard, correct?
A. It's not a regulation.
Q. That didn't happen with the B Battery Door Leak Standard?
A. No, it did not. Yes.
Q. Okay. And when you're developing a regulation, you have to determine what's reasonable

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and what can be achieved, correct?
A. Yes.
Q. And you evaluate things like technology?
A. Yes.
Q. You evaluate things like best operating practices?
A. Yes.
Q. You evaluate manufacturer's recommendations for equipment?
A. Yes.
Q. Okay. That wasn't done with the B Battery Door Leak Standard?
A. No.
Q. Okay. You mentioned that the B Battery Door Leak Standard is based on what U.S. Steel could meet?
A. Yes.
Q. Okay. Have you seen the date on which that standard was based?
A. Yes.
Q. Can you look at Exhibit Eight? Sir, Exhibit Eight is the data on which the B Battery Door Leak standard was based, correct?
A. No.
Q. It's not?
A. No. I had mentioned this before during this

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hearing that there was a five-month period in 2015 for
which the B Battery was able to meet that standard.
This is not all of the data. This is 2016 data.
    Q. So, your testimony now, under oath, is that
this is not the data on which the Department based the
B Battery Door Leak Standard?
    A. I could not tell you without a reasonable
doubt if this was the only data that was used for
that. But I know that I am aware that there's data in
2015 that shows that U.S. Steel can meet that
standard.
    Q. All right. Sir, I need to understand what
your testimony is. You realize that you're under
oath, right?
    A. I realize that I'm under oath, but also --
    Q. Well, let me ask you the question.
        MR. WILLIS: Let him finish his comment.
        HEARING OFFICER SLATER: Let Mr. Kelly finish
his answer.
    MR. KELLY: Okay. This is not all of the
data. This is data that was -- this is the most
recent data that was being used to develop this
standard. There is more data. And so, if this -- I
don't know if this was the only data that was shared
with you.
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    I don't know if this was the only data that was
    considered, but there is data that demonstrates that
U.S. Steel can reasonably meet that standard. And not
only were they meeting it in 2015, they were -- the 10
leaks per month, they were meeting it far below that
standard.
BY MR. DAUSCH:
Q. Okay. So, let me back up to my question.
A. Okay.
Q. Is this the data on which the Department
based the B Battery Door Leak Standard?
A. I do not know if this is the only data that
was used to base that standard.
Q. Okay. Did you know that we asked the Department to respond to that question through verified discovery responses in this case?
A. Yes.
Q. Okay. And you understand that a party can ask another party for verified discovery responses, right?
A. Yes.
Q. And the County has to provide verified discovery responses back to those questions, right?
A. Yes.
Q. And those responses are provided under

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penalty of perjury, right?
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A. Yes.
Q. Okay. And that happened in this case, correct?
A. What happened?
Q. U.S. Steel asked those types of questions to the County?
A. Yes.
Q. Let's look at those. Let's look at Exhibit Seven. About one-third the way through this document are the County's responses to U.S. Steel's second request for production of documents, and $I$ specifically want to look at Number 14. It's about two-thirds of the way through the document.

HEARING OFFICER SLATER: Is it the one that starts with, "Identify all emission -- or --

MR. DAUSCH: No, it's the second response to
the document requests, Number 14. It's about two-thirds of the way to the back.

MR. KELLY: Right here.
HEARING OFFICER SLATER: Okay. I've got it.
Thank you.
BY MR. DAUSCH:
Q. Okay. I want to ask you about Number 14. And you understand that a party can ask --
A. Yes.
Q. -- another party for documents, right?
A. Yes.
Q. And one of the reasons you do that is because when the County issues an Enforcement Order, U.S. Steel obviously doesn't know all of the information that the County used to develop that Enforcement Order?
A. Yes, I understand.
Q. And that's one of the reasons we have this discovery tool available to us?

## A. Yes.

Q. And we ask this question on Number 14. We asked the county to provide all documents, including but not limited to spreadsheets and communications, that show the Department's methodology for deriving the B Battery Door Leak requirement in Paragraph Four on Page 27 of the Enforcement Order, right.
A. Yes.
Q. And the Department responded?
A. Yes.
Q. It identified a document with a Bates Label?
A. Yes.
Q. Do you see the response?
A. Yeah.
Q. It identified Document ACHD 007211?
A. Yes.
Q. That's the only document that it identified,
correct?
A. According to this document, yes.
Q. And this document that's referenced in
Document Request l4 is the exact document that we just
looked at that's Exhibit Eight, correct?
A. Yes.
Q. Okay. So, the Department told us that the
only document on which they used -- or the only
document that they used to base their methodology for
the B Battery Door Leak Standard was Exhibit Eight,
correct?
A. I wasn't part of that response, so I can't
verify that.
Q. Yeah, I know. That's what it says, right?
A. Yeah, that's what it says.
Q. Okay. Well, let's look at Exhibit Eight.
The Enforcement Order says that u.s. Steel has to have
IO door leaks or less from the B Battery coke side
doors every month for six months, correct?
A. Yes.
Q. Is there any six-month period on the document

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Steel met that?
A. For a six-month period, no. There are seven here that they very easily made that standard. So, obviously, you can meet the standard. Just attaining and maintaining the standard seems to be the problem.
Q. What happens if U.S. Steel doesn't meet that 10 door leak standard during any month out of those six months?
A. You have to hot idle your two worst performing batteries.
Q. And that doesn't even mean the B Battery, correct?
A. It's the two worst performing batteries.
Q. Which may or may not be the B Battery?
A. It may or may not be the B Battery.
Q. Okay. The Department doesn't know the expected impact on ambient air of this B Battery door Leak Standard; is that fair?
A. It would be difficult to evaluate.
Q. Right. So, you don't know.
A. Yeah. This is a comprehensive effort though.
Q. I'm correct that you don't know?
A. Yes. Exactly, yes.
Q. You talked a little bit -- I'm switching topics now. You talked a little bit about inspection
methods during your testimony with Mr. Willis, correct?
A. Yes.
Q. And you understand what methods are, right?
A. Yes.
Q. Methods are a process that inspectors use to make sure that their inspections are done reliably?
A. And consistently.
Q. And consistently, correct. They're important?
A. Yee.
Q. Okay. There are methods that are detailed in Federal Regulations?
A. Yes.
Q. One of those would be Method Nine?
A. Yes.
Q. And you've actually been certified for Method Nine, correct?
A. Yes.
Q. And methods -- for example, like Method Nine, you have to be certified, correct?
A. Yes.
Q. You have to go through training, correct?
A. Yes.
Q. You have to go through testing?
A. You have to certify every six months.
Q. Right. Not only are you certified, you have to become re-certified on a regular basis?
A. Yes.
Q. Right. There's a method called Method 303 that's also a Federal Method, correct?
A. Yes.
Q. Okay. And that's another inspection method that's in the Federal Regulations?
A. Yes.
Q. And that method requires that inspectors have a certification?
A. Yes.
Q. Okay.
A. I assume. I'm not familiar with Method 303, so I can only assume. And I would prefer not to assume, so --
Q. That's fair.
A. Yes.
Q. Method Nine relates to opacity, correct?
A. Yes.
Q. And what that is, is you're looking at the plume and trying to determine the percentage of opacity, correct?
A. Yes.
Q. You don't know one way or the other?
A. Well, I really couldn't tell you for sure because, again, I have not verified, and I have not personally seen that, so I'm not going to testify absolutely that I am aware that they are certified.
Q. Okay. And besides Allegheny County's two inspectors, there are inspectors from a third-party that are at Clairton seven days a week?
A. Yes.
Q. And those are inspectors from a company called Karamida?
A. Yes.
Q. Okay. And the County hires Karamida?
A. Yes.
Q. And U.S. Steel pays for Karamida's
inspections?
A. Yes.
Q. And they inspect seven days a week for the entire year, correct?
A. Yes.
Q. And those inspectors are looking for fugitive emissions, correct?
A. Yes.
Q. And that's what the county Inspectors are looking for, fugitive emissions?
A. Yes, for different rules though.
Q. And so, they apply different rules?
A. Yes.
Q. Okay. The Karamida Inspectors follow different rules than the County Inspectors; is that correct;
A. I -- for compliance with different rules.
Q. Okay. And your testimony on direct was that these two groups of inspectors are looking at two different things. Is that your testimony?
A. Well, I'm not that familiar with 303, again. And so, I know 303 is associated with the NESHAP. And so, I'm not going to go on record saying I absolutely, beyond a shadow of a doubt, know the differences between the two inspections because I am really not that familiar with the differences between the two inspections.
Q. Okay. And did you do anything before you signed the Enforcement Order to make sure that the appropriate inspections and methods were done?
A. Why would I do that? I have a high functioning Enforcement Staff, and so they know what they're doing. I'm not going to go and check their inspections and determine whether or not they're performing these correctly. That seems kind of
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    Q. And you mentioned opacity a little bit
earlier in your testimony?
A. Yes.
Q. Very generally, can we say that's how dark a
``` plume would be?
A. Yes.
Q. Okay. And so, Method Nine observers would
look at a plume and try to essentially estimate how dark that plume was --
A. Yes.
Q. -- and assign that a percentage?
A. Yes.
Q. Okay. That's the same thing that the COMS does on the battery stack through equipment?
A. Yes.
Q. And because Method Nine involves humans, there could be human error?
A. Yes. But the EPA has actually done studies, I know back in the '90's, that shows there's a surprisingly good consistency in association with emissions from Method Nine.
Q. Right. And they did that study, and that's part of the reason why Method Nine has such strict procedures, right?
A. Yes.
Q. And in order to have that accuracy and consistency, you want to make sure your inspectors are Q. And in order to
consistency, you want
following Method Nine?
A. Yes.
Q. And you would expect that from both the County Inspectors --
A. Yes.
Q. -- and the Karamida Inspectors?
A. Yes.
Q. Okay. The County Inspectors don't follow

Method 303; is that right?
A. I really couldn't tell you exactly which methods they're following.
Q. Okay.
A. Because I know they're 303 certified. That's
about as far as I know. Anything else, I really can't -- I'm not familiar with their inspection methods.
Q. And there are two County Inspectors, correct?
A. Yes.
Q. And your testimony is that they are both

Method 303 certified?
A. I would like to assume that.
Q. And you'd like to assume that --
A. I have not physically seen whether they're certified, so -A. Yes
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asinine, doesn't it?

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Q. Well, let me ask my question again. Did you do anything to ensure that the proper inspection methods were followed?
A. No, I didn't because I am not the person who has the expertise to determine whether or not they are following those methods. I'm not certified in 303.
Q. You had looked earlier at the Air Quality Annual Data Summary that's Exhibit 16. Do you recall that?
A. Yes.
Q. Can we open that document please, sir? The second page of this document, it doesn't have a number, but it shows a map. Do you see that page? Exhibit 16.
A. Yes.

MR. WILLIS: Hold on.
HEARING OFFICER SLATER: It's the map of
Allegheny County.
MR. DAUSCH: It's the map that's inside the cover page.

MR. WILLIS: Oh, okay.
MR. KELLY: It's not an actual -- it's not
Page Two.
MR. WILLIS: Okay.

BY MR. DAUSCH:
Q. Right. There is no actual page numbers.

It's the second page in the exhibit, correct?
A. Yes.
Q. And there is a map of Allegheny County, correct?
A. Yes.
Q. This map shows all of the different monitors that are in Allegheny County; is that correct?
A. Yes.
Q. The monitor that's on the western most side of the County is South Fayette; is that correct?
A. Yes.
Q. And we know that the prevailing winds for the County come from a southwesterly direction; is that fair?
A. Yes.
Q. Okay. So, South Fayette, because it's the southwestern most monitor, is considered a background monitor?
A. Yes.
Q. And can you explain what a background monitor is?
A. And so, it's basically the monitor that's trying to measure air pollution as it enters the

County. And so -- and it's also relative. And so, this is probably one of the areas we hope to be the cleanest in our county, but it doesn't mean it's going -- upwind can be a significant amount of industry. We do not know that. I mean, I do not know that.
Q. Okay.
A. But again, it's trying to measure what's
coming into the county.
Q. Okay. So, South Fayette, because it's background, is measuring pollution that comes into the county from somewhere else?
A. Yes.
Q. Okay. Emissions from Clairton or the Clairton Plant, you wouldn't expect those to impact the South Fayette Monitor; is that fair?
A. That is fair.
Q. Okay. I wanted to look at Page Eight. Page

Eight relates to PM 2.5; is that correct?
A. Yes.
Q. And PM 2.5 is one of the two criteria pollutants that you mentioned earlier in your testimony?
A. Well, I mentioned all six, but I mentioned two being in -- failing to attain for Allegheny County.
Q. Right. And one of those two is PM 2.5, correct?
A. Yes, fine particulate matter.
Q. Okay. And 2017 is the most recent data that we have available to us; is that fair?
A. That is fair.
Q. Okay. On Page Eight there's a chart that shows how the data for PM 2.5 has changed from 2016 to 2017; is that correct?
A. Yes.
Q. It shows each monitor, correct?
A. Yes.
Q. And the South Fayette Monitor increased more than any other monitor; is that correct?
A. Yes.
Q. Okay. So, background PM 2.5 went up more than any other monitor in the county, correct?
A. Yes.
Q. Okay. And obviously background represents PM 2.5 that would be transported into the county, correct?
A. Yeah, and that's background under those conditions.
Q. The Liberty Monitor is the monitor that you would associate with the U.S. Steel Clairton Plant,
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correct?

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A. Yes.
Q. That didn't go up as much as background; is
that fair?
A. That is fair
Q. And you talked a little bit about H2S in your direct testimony. Do you remember that?
A. Yes.
Q. H2S, there's no federal standard?
A. No.
Q. It's not a public health standard?
A. No, it's not.
Q. H2S doesn't have an impact on public health?
A. Well, there's -- there's no federal standard for the protection of public health for H2S.
Q. Okay. It's a nuisance standard?
A. It is. The State has a standard, and it's based on nuisance.
Q. Right, and the nuisance would be odor?
A. Yes.
Q. It's not a health-based standard?
A. It is not based on health, and the State is clear about that.
Q. And the Department has an odor regulation in Article 21?
A. Yes.
Q. Okay. And it has an odor regulation where if there's an odor complaint, the Department can go out and do an investigation of that odor complaint, correct?
A. Yes.
Q. And the Department has a Source Test Manual?
A. Yes.
Q. And that Source Test Manual has detailed procedures that the Department has to follow when it goes out and does that odor complaint inspection?
A. I don't know how detailed it is. I don't know the procedures manual for the odor test.
Q. Okay. Can we at least agree that the Source Test Manual does have a procedure?
A. Yes.
Q. Okay. Can we agree that there are no alleged violations of the odor regulation in the Enforcement Order?
A. Yes.
Q. And can we agree that U.S. Steel has not
received any notice of violations related to the odor regulation in the period that's at issue in this case?
A. Yes.
Q. The Clairton Plant isn't subject to any H2S
emission limits at any emissions points at the facility; is that fair?
A. That is fair.
Q. Okay. You testified earlier that the modeling data that's Allegheny County Health Department Exhibit Three is not sufficient?
A. No, it's not.
Q. You just don't believe it?
A. It's not that I don't believe it. I have never in my professional career ever received modeling results without inputs. I mean, that's something that's just so bazaar. You would not -- it just doesn't make sense.

It's like, "Take my word."
Okay. And then -- because when you receive modeling results -- if you use modeling results, then, well, what are your inputs, what are your assumptions, and how did you run the model? That's how you receive modeling results.

You don't get a one-page summary that says, "Here. This is the results."

And so, it doesn't pass the eyeball test.
Q. Was that apparent to you as soon as you received it?
A. It wasn't. I was concerned because I saw
this data and I made some comments and then I followed up on this data in talking to our modeling folks. And I was like -- I would hope that they had more than just this. They did not, and I did not know that at the time.
Q. This document shows that the water treatment plant has the biggest impact on H2S --
A. Yes.
Q. -- in Clairton?
A. Yes, according to modeling with no results and no assumptions.
Q. I understand that you're saying that now, but there was a time period when you were telling people that in written documents that the water treatment plants have the biggest impacts on the H2S?
A. Yes. You're absolutely correct, and I was incorrect at the time.
Q. Okay. So, now you're changing your position?
A. I was very clear about this. I was making a statement based on the only data that I had available at the time. And so -- and I followed up on that data to make sure. And then this didn't pass the eyeball test, so --
Q. And we can agree that the county hasn't done any H2S modeling; is that correct?
A. Not that I'm aware of.
Q. Okay. Is it your testimony that air
emissions inventories are more accurate than modeling?
A. Well, it depends on what they're being used for. And so, -- and there's a lot of assumptions. That's a very broad statement that very few people would make.
Q. Well, are you saying that you never believed this document with the modeling results for H 2 S because it's inconsistent with air emissions inventory data?
A. I didn't say I never believed it. I said at first I had hoped that it was correct because it was a document that we had. And then in following up, I realized that there was insufficient data to put any confidence in this whatsoever. And I think you're getting at because there was no emission inventory data --
Q. You mentioned emissions inventory data in your direct testimony, correct?
A. Yes.
Q. And did you say that that data is what makes you not believe this modeling data?
A. That is one of the things that makes me not believe this because it's a model. And so, you --
what do you start with? You start with emissions data and then you have to make correct assumptions on meteorology and then you have to make correct assumptions on the characteristice of the plans. And so, you have a stack, and you have to know the height, you have to know the temperature, and the velocity.

For Clairton Municipal Sewage Treatment Plant, which is located here, you have to look at this. How does -- how is that going to be modeled because that is all fugitive emissions? And so, those are a lot of assumptions.

It's pretty difficult to model fugitive
emissions. We have very, very specific procedures for modeling your batteries because they're fugitive emissions. And so, -- again, these are these thinge that don't add up because they should cause anyone familiar with modeling to start to doubt this.
Q. Because the County has never done its own H2S modeling, it doesn't have any modeling results that are inconsistent with this document; is that fair?
A. That I'm aware of, yes, that is fair.
Q. Hot idling is one of the sanctions that's in the Enforcement Order, correct?
A. Yes.
Q. It's a significant sanction?
A. Yes.
Q. Okay. And you know -- you're a mechanical engineer?
A. Yes.
Q. You know that hot idling can have detrimental effects on a battery?
A. I would assume that it probably would.

That's what I heard from U.S. Steel repeatedly, that it has detrimental effects, so I'll have to take you at your words.
Q. Well, you're not a novice. You're a mechanical engineer?
A. Yeah. I'm a mechanical engineer, and thermal stresses. But being also an engineer, -- it's, like, what are the thermal stresses between hot idling and regular coking operations? I don't know what those differences are. If they're significantly different, there's going to be degradation.
Q. And you understand the idea of thermal stress being caused by hot idling?
A. Yes.
Q. And you understand that the age of the battery can impact the thermal stress in whatever damage is caused to a battery?
A. Yes.
Q. Okay. And you understand that thermal stress can have a greater impact on batteries that are older?
A. Yes.
Q. When deciding on the hot idle sanction in the Enforcement Order, the Department didn't consider impacts on the community in terms of jobs?
A. Why would we? Do you want me to explain that?
Q. No. I want to know if you considered it, yes or no?
A. No, we did not.
Q. Okay. And the Department didn't consider what it could potentially cost U.S. Steel to deal with this order with a hot idle?
A. No. I mean, we knew that it was going to be a significant impact as far as being something that's going to dissuade this type of activity.
Q. And hot idle is one of the penalties that's
A. That's one of the penalties. You know, it is our understanding that U.S. Steel wasn't taking care of their batteries.

And so, you say, "Well, an older battery is going to be effected by a thermal stress more."

And well, if it was properly maintained, is it
going to be the same? I think we're in this situation because our inspectors have observed a lack of maintenance in maintaining your batteries.
Q. You had mentioned earlier the NESHAP

Regulations. Do you recall that?
A. Yee.
Q. What's NESHAP stand for?
A. The National Emission Standards for Hazardous Air Pollutants.
Q. Okay. And those are Federal Regulations that apply specifically to coke batteries?
A. Well, they apply to all sources of emissions for hazardous air pollutants as the EPA has promulgated.
Q. One of those sources being batteries?
A. One of those sources would be coke ovens.

That's not the only NESHAP.
Q. And I think you mentioned that one way that NESHAP regulations are developed are you actually look at existing sources?
A. Yes.
Q. And you look at the technology that exists?
A. Yes.
Q. And you base the NESHAP standards on the top 12 highest performing sources in the country?
A. Well, the ERA does. I don't.
Q. Right. When someone is -- there's a process that goes through that?
A. Yes, there is.
Q. Do you know what the top 12 highest performing coke plants were when the NESHAPs were created?
A. I have no familiarity with this NESHAP process.
Q. Okay. So, you wouldn't know whether or not Clairton was the Number One performing facility?
A. I would not, no.
Q. And NESHAP regulates fugitive emissions sources at the batteries, correct?
A. NESHAPe measure -- or regulate hazardous air pollutants. Fugitive emissions is a surrogate for that.
Q. That's fair. And the NESHAPs that regulate those hazardous air pollutants, these regulations, U.S. Steel is 100 percent compliant with those?
A. Yes.

MR. DAUSCH: That's all I have.
HEARING OFFICER SLATER: Any redirect,
Mr. Willis?
MR. WILLIS: Yes, sir.

\section*{BEDIBECT EXAMINATION}

BY MR. WILLIS:
Q. Mr. Kelly, you're familiar with the Penalty Policy that was in effect in 2017, the prior Penalty Policy?
A. I'm vaguely familiar with that policy.
Q. Well, as a general principle, would you agree
that that policy was not a regulation?
A. It was not a regulation.
Q. And in 2017, could the Department deviate from that policy?
A. Yes.
Q. And so, to the extent that the new policy took -- came into place and substituted the old policy, could we have followed that new policy, even under the 2017 policy?
A. Again, it's policy. You know, we have the option to do that. We have the discretion.
Q. And I think you mentioned -- I'm sorry. You mentioned earlier that there is a regulatory maximum under Article 21 for a penalty?
A. Yes.
Q. And what is that again?
A. It's \(\$ 25,000\) per day per violation.
Q. As you recall in my opening, I had mentioned
there were over 300 violations involved in this penalty assessment?
A. Yes. It shows a lot of room for improvement.
Q. Right. Would you agree that at 300 violations, at \(\$ 25,000\) per violation, that that would have ended up being a \(\$ 7.5\) million penalty?
A. Yes.
Q. Did we assess a \(\$ 7.5\) million penalty?
A. No, we did not.
Q. So, under either policy, we did not approach anywhere near the regulatory maximum?
A. No, we did not.
Q. Okay. And you also mentioned the emission points, the 6,000-plus emission points --
A. Yes.
Q. -- on these batteries. What are they emitting?
A. They're emitting visual emissions, SO2, coke oven gas. So, they're toxics and criteria pollutants, what they're emitting.
Q. So, you would agree that that's 6,000
opportunities for the emission of BTEX --
A. Yes.
Q. -- and SO2?
A. Yes.
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Q. Okay, And I think you mentioned also that there are zero violations with respect to the COMS as we know presently?
A. Zero viola- -- I mean, --
Q. Under the 2016 Consent Agreement, that
involved COMS violations. Are you aware of any COM violations presently?
A. Well, from what I understand of the 2016, it was to show improvement. But there's still going to be violations, especially the 20 percent standard. And so, to say zero violations, that seems -- you know?
Q. Incorrect?
A. Yes.
Q. Okay. And with respect to the remedy that's imposed and the baseline that -- the first quarter of 2018 baseline, I think you said that half of that metric is the COMS?
A. Yeah. I mean, you should be happy that the COMS are in there, because it's going to greatly influence -- I mean, it's going to bring your values up quite a bit.
Q. And why is that?
A. Because, you know, the COMS are -- or because of the order, the 2016 Order, you already see

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improvements. So, if you're operating above 98
percent, but then the rest of your facility is
bouncing around between 50 or 60 or 70 or 80 -some percent, or sometimes 90 -- you know, you've already got a solid part of that average that's going to bring you up to begin with.
Q. And so, the other component of that penalty
of that particular metric were visible emissions inspections?
A. Yes, inspections based on -- yeah, visual emission inspections.
Q. And those visible emissions inspections will be from both Karamida and ACHD?
A. Yes.
Q. So, realistically, the improvement is in the visible emissions?
A. Yes.
Q. Okay.
A. I mean, it's -- when you look at improvement, -- I mean, if you've got 300 violations, your improvement is 299. I mean, why is that -- that's not really a big hurdle, is it?
Q. Well, that's what I was going to ask. If you have 300 violations, and you cut them in half, would you consider that an improvement?
A. Well, yes. But the 300 is for two quarters.
Q. Understood. The corrective action measures two quarters of performance?
A. Yes.
Q. So, if they were to cut their violations in half, would that improve their --
A. That would be a very significant increase.
Q. And would that improve air quality?
A. We would hope so.
Q. And why would you believe that?
A. Well, I mean, you can look at what we're seeing right now. Regional emissions are way down, with the exception of 2017. But overall, -- well, you know, the monitors and the inventories have been going down. In 2017, the monitor values had gone up some, and 2017 is probably a metrological consequence to that going up.

But then here we're looking at the Clairton Facility, and that monitor is starting to read higher values. And what we're seeing is degrading compliance, and the value is going up. And so, this monitor is located in an area as such that overwhelmingly measures the Clairton Facility.

Our modeling for PM has shown that
approximately -- that facility contributes almost
three micrograms. That's unheard of. I don't know of any facility in the country where a single industrial source to contribute that much.

There's a lot of sensitivity to that monitor. And ao, whatever -- it takes very amall changes in a facility to affect that value. You see. That is really sensitive, so it doesn't take much.

So, if your compliance is sliding, and all of your regional emissions are going down, with the exception of 2017 because they all went up -- but this trend has been going on since 2014. And so, that's the eyeball test. I mean, that's one of the things that you can look at. It's like, you've got degrading compliance.
Q. That three micrograms -- realistically, I think the public would probably raise an eyebrow and say, "Is that really a lot?" How -- why is that --
A. The standard is 12. Background is eightish. So, that's why that's so -- depending on where you are in the country, where is that background going to be. Six to eight. I know in the southeast, eight is almost impossible to go below because that is what a lot of your background is going to be.

Like, when we talked about that South Fayette Monitor, and -- well, it went up a lot. Well, it's
the lowest monitor, so it's got, you know, the biggest sensitivity of going up if there's a disturbance in the background. But again, three micrograms, that's pretty amazing.

I did a plan in Georgia where, you know, I controlled 10 power plants at about half a microgram. That's over 200,000 tons of SO2 and 200,000 tons of NAAQS in half a microgram. And so, --
Q. And we're talking about three here?
A. And that was a lot. And so, we're talking about three micrograms here. So, that shows you how much this facility affects the local air quality.
Q. With respect to that Battery B Door Leak requirement, counsel has noted correctly that it does -- in the event of exceeding that 10 door leak limit, that that would require an idling of the two worst performing batteries. Why not idle Battery B?
A. Because we gave U.S. Steel a lot of
flexibility by requiring them -- you know, requiring them to do their worst performing batteries. It seems a little specific, I think, to say just Battery B or just Battery something. It's performing. So, if you're the worst performing, you're creating the most emissions.
Q. So, it's conceivable that, let's say,

Batteries Two and Three can be the worst performing in terms of emissions?
A. Yes.
Q. And it would be better to idle those batteries as opposed to Battery B, which may actually be performing better than Two and Three?
A. Yes. I mean, the whole idea is performing your most -- to idle your most polluting batteries, which would be the worst performing batteries.
Q. Is there any point before the second quarter of 2019 in which you could determine what the two worst performing batteries would be?
A. In -- could you repeat that again?
Q. Is there any point before the end of the second quarter of 2019 in which you could determine what the two worst performing batteries would be?
A. You would have to take both quarters into consideration.
Q. And so, let's say that in February of next year they exceed the 10-leak limit, you could not establish what the two worst performing batteries would be until the end of the two quarters?
A. You're correct, yes.
Q. And so, that particular penalty of the idling of the two batteries would not occur until after the

\section*{first six months of 2019?}
A. That is correct.
Q. So, theoretically, if they knew in February, preparations could be made for a safe idling of that battery by the end of the second quarter of 2019?
A. That is correct.
Q. Do you know whether or not U.S. Steel has idled batteries in the past?
A. Yee, they have.
Q. Was that by order?
A. No.
Q. Do you remember when that was?
A. From what I understand, 2019, the economic downturn, there was --
Q. You said 2019.
A. I'm sorry, 2009. So, 2009, I believe, there
were a number of batteries that were idled.
Q. Okay. Are you familiar with the coke facility in Monessen?
A. I am very vaguely familiar with it.
Q. Are you aware as to whether or not that battery has been idled before?
A. I couldn't tell you for sure if that battery has been idled before.
Q. Okay.
A. I know that there are people on our staff that are more familiar with that.
Q. Okay. The Source Testing Manual, we've talked about that considerably. It's mentioned in Article 21 , but is that a regulation?
A. No, it is not. It's a procedures manual.
Q. Are we bound to follow it as a matter of law?
A. As long as it -- we follow -- not as a matter of law, no.
Q. Okay. And so, we can deviate from the Source Testing Manual?
A. It's a procedures manual. I mean, it's guidance.
Q. It's guidance?
A. Well, it's pretty strong guidance. But again, it's not a regulation.
Q. At one point there was a dispute, and correct me if I'm wrong, between U.S. Steel and the Department as to the application of the Source Testing Manual versus the regulation with respect to, I believe, the coke side of Battery B?
A. Can you read that again?
Q. Yeah, at one point in the recent past, do you recall a dispute between the ACHD and U.S. Steel --
A. Yes.
Q. -- with respect to the application of the Source Testing Manual?
A. Yes, I do, but I need to qualify my previous answer. The procedures manual does have some Federal
Regulations -- I mean, some Federal Procedures in there. They are in the Federal Register, and so therefore, they are procedures that you have to follow.
Q. Okay.
A. Any of our ACHD procedures, they don't have the -- they don't have the ability to be enforced as a regulation because they didn't go through that same process, so there is a distinction. The procedures manual does include procedures that are federally promulgated.
Q. Okay. Well, with respect to those -- those
A. Yes. And I am familiar with -- there is a contradiction between Article 21 in our procedures manual, and U.S. Steel has been given the benefit of the doubt to follow the procedures manual as opposed to the regulation.
Q. And again, that's resulted in fewer violations?
A. Yes.
Q. Which benefited U.S. Steel?
A. Yes, and I had stated that earlier. With \(B\) Side Battery door leaks, U.S. Steel is not required to -- and that's one of the things at the crux of this. They -- if you don't have to follow a regulation, why would you follow the regulation? And so, when you go back to, you know -- this in Item Eight. You show --
Q. Item Eight of --
A. They're all over the place.
Q. I'm sorry. For the record, could you please specify what you're pointing at?
A. So, when you go back to Exhibit Eight, this is the, you know, coke oven door leaks. If this -- if this -- if the B Side Battery -- I mean, if the B Side Coke Battery Door -- if they were aubject to the regulation -- you wouldn't see these numbers fluctuating like this if they were actually subject to some type of violation. But they're not.

So, where is the -- you don't have the initiative to maintain these doors because they're not subject to Article 21 because of a provision of the Source Testing Manual. Which we have argued about this in the past, and we have given U.S. Steel the benefit of the doubt that they don't have to comply with that.
Q. I understand. In looking at -- since you've
brought up Number Eight, if you would look to -- for
instance, July '16? Do you see the month/year where
it says July '16?
A. Yes.
Q. Yeah. How many coke side door leaks do you see in that fourth column for July of '16?
A. Nine. For July of '16?
Q. For the column right before?
A. Oh, I'm sorry. I'm sorry, 114.
Q. Okay. And then right before that -- or right after that you said, "Nine," and that column is -represents the coke side yard equivalent for door leaks?
A. Yes. And that's based on equivalent. It's interesting -- since you brought that up, look at the
door leaks on the push side. Zero. There are lots of interesting -- since you brought that up, look at the
door leaks on the push side. Zero. There are lots of zeros here.
Q. And why is that interesting?
A. Because it shows that they're maintaining the doors that are subject to the regulation, and then those are almost all single digits in the push side leaks. And then when you look at the coke side leaks, those are triple digits. It just basically shows why -- I mean, I know that those are coke side and they're subject to more thermal stress and so you would

1 typically have more leaks there. But when you go from zero from July '16, to 114 leaks -- so, that's --
3 Q. And again, I think we've mentioned this earlier. Leaks -- any leak is an opportunity for an emission?
A. Yes, it is.
Q. BTEX?
A. Yes.
Q. And SO2?
A. Yes.
Q. And H2S?
A. Particulate matter and H2S.
Q. Particulate matter?
A. Yes, and raw coke oven gas.

MR. WILLIS: Those are my questions.
HEARING OFFICER SLATER: Any recross?
MR. DAUSCH: Yes, very briefly.

\section*{RECROSS-EXAMINATLON}

BY MR. DAUSCH:
Q. The baseline calculation, half of that is COMS compliance?
A. Yes.
Q. And you said that U.S. Steel should be happy about that?
A. Yes. So, you already have a very large
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number that you can average in, and so -- does that
make -- basic math is going to tell you that if you're
over 98 percent, and you're averaging in something
else --
Q. For the baseline for the 2018 first quarter, what was U.S. Steel's COM compliance?
A. FOI 2018?
Q. Yeah.
A. I couldn't tell you exactly what that number
was.
Q. Does 99.384 sound right?
A. Yes.
Q. Okay. So, that's the baseline, 99.384?
A. Yeah.
Q. And one of the reasons the COMS compliance --
A. No, that's half. That's half the baseline.
Q. Right. And one of the reasons COMS
compliance is as high as it is, is because there was a 2016 Consent Judgment, correct?
A. Yes, we'll go with that.
Q. And COMS has improved since 2016?
A. Yes, COMS has improved.
Q. Okay. It's improved to the point where it's 99.384 percent compliant for the baseline, correct?
A. Yes. So, I'm assuming your number is

\section*{correct.}
Q. Okay. And so, now, for two quarters, U.S.

Steel has to improve again and improve again, correct?
A. Not just that number. So, you're -- we're not improving just on the COMS. The area for improvement is the other half, the inspections, the lower number.
Q. Right. But 50 percent is the COMS that
raises the number, correct?
A. Yes.
Q. So, let's say we go through this baseline and in the first quarter in 2019 U.S. Steel has 99.5
percent compliance overall?
A. Yes.
Q. It beats the baseline?
A. Yes.
Q. And then in the second quarter, it improves
again to 99.8 percent compliance?
A. Yes.
Q. But in the last month it has 11 coke side door leaks on the B Battery, what happens?
A. Then you're going to idle two of your worst

\section*{performing batteries.}

MR. DAUSCH: That's all I have.
REDIEECT-EXAMINATION

BY MR. WILLIS:
Q. Counsel mentioned that 99 percent is a pretty high number. Let's do some math. If you have 10,000 inspections in any given month, and you have 900 of those that are compliant, how many -- what is the percentage rate of compliance?
A. Ten thousand -- wait. A thousand or ten thousand?
Q. Ten thousand. So, if you have 10,000
inspections, and 900 are --
A. Nine thousand --
Q. Nine thousand of those --
A. Yes.
Q. Sorry, 9,000 of those --
A. So, you're going from 9 percent to 90 , so -okay.
Q. Understood. So, you're saying it would be 90 percent compliance?
A. Yes.
Q. Which would mean that there would be 1,000 non-compliant inspections?
A. Yes. It seems like a lot of opportunities for improvement.
Q. And so, with -- bearing that in mind, to move from 99.2 to 99.8 would represent hundreds of
inspections; would that be fair?
A. That would be fair.

MR. WILLIS: Okay. That's all I have.
MR. DAUSCH: And, Mr. Slater, we had used
Exhibit U.S. Steel 54 with this witness. And subject to the objection, I'd move for that to be admitted. And in that case, I think we now have -- every other exhibit in U.S. Steel's binders have been stipulated to, so that's the only one that there's no stipulation on.

HEARING OFFICER SLATER: Mr. Willis, is it your understanding that except for 54, all of the other exhibits have been --

MR. DAUSCH: These are all from the last time, and we can talk about it if you want.

MR. WILLIS: Well, I would like to reserve the possibility that there would be any other document that I have not come across yet that would be subject to attorney-client privilege. I'm very, very adamant about asserting that privilege when my clients are attempting to reach out to me for input.

HEARING OFFICER SLATER: I understand your objection, Mr. Willis. I will admit Exhibit 54. I will hold off on the admission of the other ones for now, until -- pending any further discussions relating
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to attorney-client privilege.
MR. WILLIS: Okay.
HEARING OFFICER SLATER: All right. Any
other questions for Mr. Kelly?
MR. DAUSCH: Not for Mr. Kelly.
HEARING OFFICER SLATER: Mr. Willis, any --
MR. WILLIS: No, no further questions.
HEARING OFFICER SLATER: Well, with that,
let's take lunch, and we'll come back here at 1:30.
(The hearing recessed at 12:30 p.m. and
reconvened at 1:35 p.m.)
HEARING OFFICER SLATER: All right. We are
back on the record. Mr. Willis, you may call your
next witness.
MR. WILLIS: I would call Jayme Graham.
JAYME GRAHAM, called as a witness, being
duly sworn by the court reporter, testified as
follows:
DIRECT R:XAMINATION
BY MR. WILLIS:
Q. Ms. Graham, could you state your full name
for the record?
A. It's Jayme Graham.
Q. How do you spell that?
A. J-A-Y-M-E G-R-A-H-A-M.

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    Q. Thank you. As with Mr. Kelly, I'm going to
presume that you've graduated from high school?
    A. I did.
    Q. And then where did you -- did you go to
college after that?
A. I did.
Q. Could you tell me where?
A. The University of Pittsburgh.
Q. What year did you graduate?
A. 1980 .
Q. And with what?
A. A bachelor's of science in chemical engineering with a specialty in environmental engineering.
Q. Okay. Did you have any formal education after that?
A. I've taken occasional courses when we have a number of courses for pollution control and things like that. They're specific classes with no certification involved, other than a little piece of paper that says, "Look. You took this course."
Q. And that's just to further your education?
A. Yes.
Q. Thank you. Could you explain the organization of the Air Quality Program in Allegheny

County?
A. Sure. It's one of the departments of the

Health Department. We have four distinct sections and then the special task force. We have the Enforcement people, the -- well, actually, let me start with the monitoring. The Monitoring Staff that measures the air, and we have the Planning Staff that takes that data and determines whether or not we have a problem and what we're going to do about it.

The Permitting Section, that's engineering, and they turn these into permits; and then Enforcement that does the enforcement of the activity. We also have an asbestos group, which is its own separate because it does both enforcement and permitting.
Q. And with respect to asbestos, that's still covered under Article 21, their activity?
A. Yes.
Q. Okay. I'm going to jump right into SIP development. Is there modeling data concerning the emissions at Clairton for use in this SIP development?
A. For SO2 and particulates because those are the areas we're interested in in the southern area. For Ozone SIP, the -- it would include Clairton modeling. But it's a broader model, so it has a lot more different sources.
Q. And when you say, "Broader modeling," what do you mean?
A. Our ozone non-attainment area designated by the ERA includes Allegheny County and the six counties that surround Allegheny County. So, the State is responsible for developing the plan for that that includes all of the sources in that area, as well as from emissions that come in from outside the area.
Q. Are you familiar with the -- with what's called emissions inventory?
A. Yes. There are many emissions inventories, but I know the term, yes.
Q. Could you explain to me what an emissions inventory is?
A. It's a -- it's a tally. It's an estimate of what is actually coming out of either a specific plant or a group of plants or even mobile sources and area sources. It's to try to get a good idea of what is -of what the emissions are that are going into the air.
Q. Does it take into consideration fugitive emissions?
A. Certainly.
Q. Does it calculate the quantity of fugitive emissions?
A. Well, it's very difficult to calculate
fugitive emissions. When you have stack emisaions, they often can be measured through either direct measurement -- either a monitor that's continuously running or stack tests that periodically go in and actually measure.

Fugitive emissions are harder to measure. In fact, in many cases it's impossible to measure, so we use what's called an emission factor. And that's something that's set up by the ERA or someone else that says here's the approximation of the emissions that would be used, and we use it as a surrogate for actually having real measured emissions.
Q. So, if the emissions inventory indicates a certain quantity of a fugitive emissions, it's not an accurate number necessarily?
A. It's not an accurate number. It's an estimate. It an approximation. I could give you an example.

An example would be -- the subject that we have is the battery fugitives. For the risen emission factor that the EPA used to have, we simply said that if you produce this much tonnage of coke, you have this much emission. It could be a well working battery, or it could be a lousy operating battery, but because you created this much, -- you know, that was a
very poor emission factor. It was a very poor one to use.

The EPA has improved it somewhat to say now we count how many batteries are leaking. If you have four batteries leaking, you have this much tonnage. If you have 10, you have more; or 8, you have twice as much. It still doesn't take into account if it's just a little whisp of smoke or if it's a barreling amount of smoke. It's just because you have four battery doors leaking, you have this much emission.

So, it's an approximate, but it doesn't really take into account the quality of the emissions.
Q. If you had four -- I'm using your number. If you had four door leaks versus four high opacity leaks, would there be any way to make that distinction within the emissions inventory?
A. There's not a practical way. Sometimes we try to put some numbers in, but we generally don't because we don't have any data to -- to come up with any better numbers than that.
Q. Okay. So, it's fair to say that the emissions inventory does not account for opacity or duration of any particular leak or emission?
A. Again, we use emission factors, but they're very, very rough numbers. And often times, we just
ignore that because we don't have any good data to work with.
Q. Okay. But with respect to opacity and duration of any particular leak, that is not --
A. Opacity itself would not be an emission value, yes. We're trying to turn that into a particulate level or some sort of gas level. So, we would not have opacity numbers in an emission inventory.
Q. Okay. Could you ex- -- I think you -- either you or Mr. Kelly have indicated that VEs, or what we call visible emissions, are a surrogate for the actual emission of any fugitives, let's say?
A. Sure. That's true.
Q. Why is that?
A. It goes back to not being able to measure in many cases. Even the visible emissions that come out of a stack, it's -- it's measured by a Continuous Opacity Monitor. And what it does is it sends a light beam through and measures and sees how much the light is scattered by how much particulates there are in that gas that's coming up.

But it's not a direct measure of the
particulates. We know that if there's more light scattering, there's more emissions than there was when
there were less. But how much? And there's a lot of attempts to make relations between the opacity and emissions, but it's very rough numbers.
Q. Okay. I'm going to switch gears to our new policy -- penalty policy. Do you recall when that went into effect?
A. January 10th of this year.
Q. Okay. Do you recall it going through Air Advisory for consideration?
A. No. This is a policy. We don't take policies to the advisory committee.
Q. Okay. Did it pass the Board of Health for consideration?
A. It was presented to the Board of Health, but it was not approved by the Board of Health though.
Q. Was it presented to the Board of Health prior to it being effective or after?
A. I think it was presented after it was signed as information.
Q. Okay. With respect to the Penalty Policy that was in effect in 2017, do you recall the ability to deviate from that policy?
A. Certainly. We have and we do deviate from these policies from time to time.
Q. Okay. And do you know of any particular
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conditions which would cause a deviation from a
Penalty Policy?
A. Well, a consideration on the work that a
company is doing, or vice versa with some with more
difficulties that they're having that we may need to
be higher. But we have given consideration for work
that people have done.
Q. Okay. And I believe I've asked Mr. Kelly,
but I will ask you as well. What is the regulatory
limit for our penalties under Article 21?
A. It's \$25,000 a day per violation.
Q. Okay.
A. That's the State -- that's the State limit.
Q. That's the State limit. Is the State
conditions which would cause a deviation from a Penalty Policy?
A. Well, a consideration on the work that a company is doing, or vice versa with some with more difficulties that they're having that we may need to be higher. But we have given consideration for work that people have done.
Q. Okay. And I believe I've asked Mr. Kelly, but I will ask you as well. What is the regulatory limit for our penalties under Article 21?
A. It's $\$ 25,000$ a day per violation.
Q. Okay.
A. That's the State -- that's the State limit.
Q. That's the State limit. Is the State

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considering changing that limit?
    A. I don't believe so. I don't know.
    Q. And would we change it unilaterally?
    A. We would not exceed that. That's the state
limit, but we would consider it. If the state was
changing it, we would consider it.
    Q. So, the best case scenario, you would not
even be able to exceed the limit that's established by
the State, so we, without the State, would not be able
to go beyond \(\$ 25,000\) per violation?
    A. I don't know that for a fact, but I don't
believe so. I think we would be bound by the \(\$ 25,000\)
per day per violation.
    Q. Does the County enforce the NESHAP?
    A. Yes, we do.
    Q. Are you aware as to whether or not the
regulations under Article 21 constitute a more
stringent standard?
    A. They do.
    Q. Do you know why?
    A. Most -- primarily, it's because of our stated
limitation plans for our attainment of the standards,
the SO2 standards and particulate standards in the
past.
    Q. Okay. Now, you have some recollection of
these quarterly penalties. Do you know how long the
County has been issuing quarterly penalties against
U.S. Steel?
    A. Well, we meet regularly with the company
whenever there's violations to make sure and see what
they're doing to repair those violations and what
they're doing. But for the past several decades,
we've -- by agreement, we've said we'll just gather up
the penalties, and we'll file them every three months.
I know it's been several decades. I don't know how
long it's been. considering changing that limit?
A. I don't believe so. I don't know.
Q. And would we change it unilaterally?
A. We would not exceed that. That's the state limit, but we would consider it. If the state was changing it, we would consider it.
Q. So, the best case scenario, you would not even be able to exceed the limit that's established by the State, so we, without the State, would not be able to go beyond \(\$ 25,000\) per violation?
A. I don't know that for a fact, but I don't
believe so. I think we would be bound by the \(\$ 25,000\) per day per violation.
Q. Does the County enforce the NESHAP?
A. Yes, we do.
Q. Are you aware as to whether or not the regulations under Article 21 constitute a more stringent standard?
A. They do.
Q. Do you know why?
A. Most -- primarily, it's because of our stated limitation plans for our attainment of the standards, the SO2 standards and particulate standards in the past.
Q. Okay. Now, you have some recollection of these quarterly penalties. Do you know how long the County has been issuing quarterly penalties against U.S. Steel?
A. Well, we meet regularly with the company whenever there's violations to make sure and see what they're doing to repair those violations and what they're doing. But for the past several decades, we've -- by agreement, we've said we'll just gather up the penalties, and we'll file them every three months. I know it's been several decades. I don't know how long it's been.
Q. Okay. Do you recall the third quarter of 2017 penalty -- quarterly penalty?
A. Yes, I do.
Q. Do you know whether or not U.S. Steel paid that penalty?
A. They did, yes.
Q. Did they pay the full amount of that penalty?
A. They -- they did not pay the full amount of the initial penalty. We had met with them to discuss, again, what the issues were and what kind of controls there would be. But as part of our discussion, I allowed for a reduction of the penalty by 20 percent. This is something that used to happen much more frequently. We very, very rarely give a reduction in penalties, but we still do that.

And the consideration was since this was the first time the penalty was -- policy was being used for such a large penalty, that we would give that reduction. So, they did pay 20 percent -- or 80 percent of the original amount.
Q. Now, when you say that policy, you're referring to the 2018 policy?
A. The 2018 policy.
Q. So, the first time that a quarterly penalty was issued against U.S. Steel using the new Penalty

Policy was with respect to the third quarter of 2017 ?
A. Yes.
Q. And you indicated to them why we were reducing the penalty amount?
A. Because it was the first time that it was in use and just to understand how we were using this penalty and -- and so we gave that -- allowed for a reduction.
Q. So, this is actually the second penalty against U.S. Steel using this new policy?
A. No, this would be the -- this one that we're talking about, the fourth quarter and the first quarter, would be the fifth time we've used the penalty.
Q. Okay.
A. For U.S. Steel.
Q. For U.S. Steel.
A. We've used it for many other sources.
Q. I see. Are you considering -- in your calculations, are you counting the asbestos violations as well?
A. Yes. There was a -- an asbestos violation, a significant one, and then there were three reporting violations at three plants. They weren't all at clairton. The three reporting violations were at
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Clairton, Edgar Thompson, and Irvin Works.
Q. And the reporting violations, what were those violations regarding in terms of --
A. These all four were asbestos. So, the main violation was asbestos, and the reporting violations were asbestos. In the asbestos rules, you're required to submit a plan every time you remove asbestos.
Well, that becomes very cumbersome for a company -- a large company or a large facility that is regularly going to be removing asbestos from different parts of the plant. So, there's a permit allowance for something called, "Operation and maintenance," or an $O$ and $M$ Permit, and you submit it yearly.
You submit the application yearly, and it says, "This is what we think we're going to do this year."
And as long as it stays within some restrictions, then they can -- then they submit quarterly reports that says, "Okay. This is what we accomplished and this is how we did it correctly. This is what we accomplished, and this is how we did it correctly."
These reports have not been submitted for several years, all the way back to 2015. And so, they received penalties for all three plants for not submitting their quarterly reports.
Q. And so, with respect to at least one of those

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penalties against Clairton, we issued a penalty against violations that occurred in 2015?
A. Yes. It was reporting violations in 2015.
Q. And we used the 2018 Penalty Policy for the violation?
A. Well, certainly, yes.
Q. Okay. Why do you say certainly?
A. Because that was the Penalty Policy in place.
Q. You wouldn't use the 2015 Policy for a 2015

Violation in 2018?
A. No. This is the policy that's in place, so this is the one that we use.
Q. Okay, And similarly, with respect to -- I believe there was an asbestos violation for the actual removal of asbestos?
A. Yes.
Q. Do you recall when that violation occurred?
A. It occurred sometime in 2016. I think it was early 2016. We heard about it in 2017. We issued the penalty in 2018 once we received all of the information because it went through Federal Enforcement as well.
Q. Okay. Now, do you recall whether or not U.S. Steel appealed any of those Enforcement Orders?
A. They did not appeal the third quarter of

2017, the first one. They did appeal the asbestos -all four of the asbestos actions, but they have withdrawn -- they have since withdrawn their appeals.
Q. Okay. I'm not sure if I asked you, but I'll ask you one more time for my own clarification. With respect to the Source Testing Manual, is that a regulation of ACHD?
A. No.' It's a policy, just as the Enforcement Policy is a policy.
Q. Could you explain the difference or how these two documents relate to each other, namely the Source Testing Manual on the one hand and Article 21 on the other?
A. Well, Article 21 is our regulations. It has gone through a full promulgation process, and it is approved by a number of levels of government and this is the regulation that we stand by.

And the Source Testing Manual is a manual. It is an operations manual. It's how we do it, and we try to -- you know, we -- it's sort of -- our operations manual is sort of like a driver's manual.

The regulations would be just like your regulations, your speed limits and your inspection maintenance requirements. But your operations manual is how you operate and how you do the stuff to

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accomplish the others.
Q. Okay. There was an issue, I believe, last
year. And correct me on the timing of this, but there was some discrepancy or some dispute as to the County should adhere to the Source Testing Manual versus the Article 21 Regulations? Do you recall that dispute?
A. Yes. I don't recall the date either.
Q. That's fine. Could you explain for the
benefit of Mr. Slater and the record what that dispute involved?
A. This is the -- this is a rule that says -that was written originally to stay that -- the intent that you look at -- when you're looking at doors that are leaking, there had been a rule -- a regulation that said that you discount the last two doors that were charged.

So, if the battery has been charged, the intent is it takes -- it takes a few minutes for the build up around the door, so you don't count them when you're -- when you're doing your inspection. So, you shouldr't count those two and give them a few minutes for them to set up, essentially, so they won't leak. HEARING OFFICER SLATER: So, not counting the last two doors?

MS. GRAHAM: The last two doors that were

\section*{charged.}

HEARING OFFICER SLATER: Okay.
MS. GRAHAM: So, you have to know which ovens -- which was the last oven that was charged, and you don't count those two doors. That's what the regulation says.

The Source Testing Manual simplified that and said when you -- after you do your inspection, you subtract two doors. So, it wasn't the last two charged. It was just simply subtracting two doors.

And it was for simplicity purposes because, at least when it was written -- when the source Testing Manual was written, it was really difficult to find out which door was charged. You had to get back off the battery, you had to call somebody, and you had to find out which was the last one charged. And so, it was done for simplicity purposes.

The beginning of -- I don't want to say the beginning of this year. The beginning of last year -I think it was the beginning of last year, we realized that we can find out which ones were the last charged. And to properly follow Article 21 , we need to be discounting the last two doors that are charged.

Now, that makes it a tighter regulation.
Well, it makes -- well, the regulation is the
regulation, but it becomes -- you end up with higher violations because if those last two doors were not leaking, that means you're counting all of the leaking doors, instead of subtracting two doors.

So, U.S. Steel asked for a meeting and we discussed it and they were concerned and they said, "Wait a second. You're changing what you're doing."

And we said, "Well, the Source Testing Manual only says subtract two. The regulation says the last two that were charged."

And we went back and forth. And since we were in the process, unfortunately, for a long time and in the process of rewriting the Source Testing Manual, at the end of that meeting, we discussed and we said, "For now, we will agree. We will go back to the Source Testing Manual, even though we know that's not what the regulation says, and we know that's less than what the regulation says, but we will go back to that process for now, until we change the source Testing Manual to match what the regulation is."

So, in this case, the Source Testing Manual is actually weaker than the regulation, but we have agreed to abide by that.
BY MR. WILLIS:
Q. And as a result of that, like \(I\) believe you
were saying, it's that U.S. Steel benefited from the application of the Source Testing Manual versus the regulation?
A. Yes. It is a weaker -- it is a little bit weaker because -- well, actually, in many cases, we've counted -- and in some cases, it's significantly weaker because we're just discounting two doors instead of just the last two that were charged.
Q. And that's not the only occasion in which the County has deferred to the Source Testing Manual; am I correct in that? I'm speaking with respect from the -- from the distance from the -- from the battery in terms of doing an opacity reading.
A. You know, I'm not that familiar with the -the yard equivalent calculations. I think you'll need to ask Dean about that.
Q. Okay. Has the Department issued a million-dollar-plus penalty in the past?
A. Certainly, yes. Not certainly, but yes.
Q. Are you aware of any greater penalties assessed against U.S. Steel itself for environmental right violations?
A. I'm aware of a penalty that happened around 1980. There was an extreme EPA -- it was against nine plants at U.S. Steel in this area, in the Southwestern

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Pennsylvania area. The final settlement was for \(\$ 400\) thou- -- \(\$ 400\) million worth of improvements, with a penalty of \(\$ 18.3\) million.
Q. Okay. Are you aware of any potential controls for -- for gases generally.
A. Well, it depends on where the gas is and how it's produced, but, yeah. There' a lot of possible controls. There's bag house -- well, for particulate -- are you asking just for gases?
Q. For gases.
A. For gases, there are scrubbers. There are containment -- ways to contain the gas, so it doesn't get out into the atmosphere to begin with. There are filters. There are other processes that can be used to contain the gas.
Q. Can you describe what a scrubber is?
A. It's -- it's like a washing machine. It's a rain -- it's -- it would be water or some chemical. It's usually water with a chemical, but it comes down and the air -- the gas -- the dirty gas comes up and it is attracted to the liquid that is coming down and gets absorbed by it and then the clean gas then goes out the top.
Q. To your knowledge, is there a scrubber on Battery B?
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A. There is not.
Q. Is there any control device to capture and control gaseous emissions from Battery B?
A. Not gaseous emissions, no.
Q. You sort of prefaced that. Is there another control that you're aware of for Battery B?
A. Well, the -- the shed controls -- or captures most of -- not all, but a significant -- some of the particulate emissions, and it goes to a bag house.
Q. When you say some of, what is not being captured?
A. Well, what we've -- our inapectors have come back and said that there's a small space that has to be between a shed -- a shed is just -- just what it sounds like. It's like a cover or a canopy that -that is near where the coke is pushed out, and this goes the length of the battery. Its intent is to capture those emiseions when the -- when the coke is being pushed out and take it to the bag house and have it controlled.
But from what our inspectors have told us, is there is -- there is a gap between the two, which is necessary to some extent because of the -- the heating and expansion. But quite often, emissions are coming up there, as well as some emissions that actually

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escape from the two ends of the shed and out the front
if there's been an overwhelming -- more often from a bad push than leaking doors, but -- and so, it does capture, but there are still significant emissions that get released.
Q. And with respect to particulate matter, or PM 2.5 , is that an emission that can make its way from the sides of that shed?
A. Yes. That's what I said. Yeah. It can escape from the out- -- from the sides, as well as the front, and from the --
Q. Can you think of any controls that would keep the emissions from escaping the shed from the sides?
A. Well, it would have to be designed, but if there was more of a capture on the side to -- you know, for the shed to come down. I don't really -- I have not seen the shed in operation, so I'm not sure what's available. But there may be some ways to put some canopy or something on the side to keep those emisaions from getting out from the ends.
Q. Has there ever been any discussion about capturing and controlling the \(P M\) from the sides or the top of that shed?
A. I'm not sure specifically for that shed. I mean, we're always talking to the company about better
controls on the plant.
Q. Okay. Have you -- you're aware of the
installation of Battery \(C\) ? Were you an employee of ACHD when that --
A. I was.
Q. -- battery -- were you an employee of ACHD at
the time that battery was proposed?
A. Yes.
Q. And was there a permit issued for the installation of that?
A. There was.
Q. And was there contemplation of just that battery, or were there intentions to do more in terms of installation of batteries?
A. The intention at the time was to do Battery C and D .
Q. Now, Battery C replaced certain batteries that existed at the time. Which ones did that replace?
A. It replaced Batteries 7, 8, and 9.
Q. And the proposed Battery D, what was that set to replace?
A. It was intended to replace Batteries 1, 2, and 3.
Q. And Batteries 1, 2, and 3, they are the
oldest batteries at that facility?
A. Yes.
Q. But that Battery \(D\) was never installed?
A. No. It was -- it was -- both Battery C and Battery D were part of a SIP, a plan -- a control plan for particulates. But right after the plan was submitted to the GPA and went through the full process, the approval process, and went to the EPA, the company came and said, "We have changed our minds. We're not going to build Battery D."

And so, we re-negotiated additional emission controls that would still bring us to attainment of that standard at the time, but did not include Battery D.
Q. And following the installation of Battery \(C_{\text {, }}\) were there continued emission problems with respect to that battery?
A. Yes. Battery \(C\) had some problems with some equalization of the pressure, and that put out some continued emissions. Not continuous, but pretty regular emission problems, and it took quite a while for the company to get it under control.
Q. How did they get it under control?
A. They installed a pressure valve that went from one -- I don't have the real specifics, but a
u-tube valve that went from one oven to the next oven, so they could equalize the pressure better.
Q. That sounds like a fairly complicated installation. Is that u-tube that was installed -did that go through the permit process?
A. Yes, it did.
Q. How long did that take to evaluate, to your recollection?
A. Well, the company came and met with us quite a few times while they were in the process of figuring this out, so the -- I mean, the permitting process went the same time line it normally does -- or did.
Q. Okay. Do sulfur compounds leaving the oven -- these oven doors where we're experiencing the leaks, do those get captured by the bag house, for Battery B to be specific?
A. Well, most of -- the sulfur compounde are mostly hydrogen sulfides. So, as a gas, they would not get collected by -- if they get caught by the -by the shed, they would not be captured by the bag house. They would be passed through as a gas.
Q. Does BTEX -- I think we've mentioned what BTEX actually are. Are those captured by bag houses?
A. No. Again, they're a gas. At least at that point, they are a gases, so they would get through the
bag house.
Q. So, any visible emissions that we see coming from those doors, would they contain BTEX or SO2 or any other gaseous emissions?
A. They would contain -- they would contain all of them. Would contain H2S. They would contain some sulfur dioxide. But mostly, it would be H2S that's going to convert into sulfur dioxide as it gets into the atmosphere and the BTEX. It would still be a gas as it's leaving -- as it's leaving the battery itself.
Q. Okay. The civil penalty that in the Enforcement Order at issue, does that cover or contemplate the same penalties that are stipulated in the 2016 Consent Judgment?
A. No, none of our -- for our Enforcement Orders, they do not include those stipulated penalties. Stipulated penalties are treated differently and separately.
Q. And has that always been the case?
A. Yes.
Q. Okay. So, the \(20-\)-- the third quarter of 2016 Civil Penalty, the Quarterly Penalty Assessment, that did not contemplate or penalize for any violations that arose under the 2016 Consent Judgment?
A. I have not read it, but it should not have.

No, it would not have. Stipulated penalties are treated separately. We send -- sometimes in an order, the company automatically sends a stipulated payment, and sometimes we send a notification for them. But that's always treated separately than the quarterly violations.
Q. Okay. Are you familiar with the -- the paragraph in the Total Penalty Assessment Section, not the Enforcement Order, which relates to the two successive quarters of continuing improvement?
A. Yes.
Q. Was the intent of that provision to reduce stack and fugitive emissions?
A. Well, certainly. That's -- the whole intent of the order is to show improvement and then continued improvement into the second quarter.
Q. Have we ever modeled for emission reductions following the shutdown of three batteries, in the event of a three-battery shutdown?
A. I'm told we have. I don't know much about it, but I think that we have looked at if Batteries 1, 2 , and 3 were shut down, but I haven't seen those results.
Q. Okay. Based on what you know about the
facility -- and it sounds as though you've been with the Department, what, --
A. For 37 years.
Q. For 37 years. Would you anticipate a reduction in the \(S O 2\) values, if -- in the event that Batteries 1 through 3 were to be taken off line?
A. Well, certainly, yes. If the batteries were to be taken down, that would be -- that would be a significant improvement in sulfur dioxide emissions.
Q. Would you find a reduction in those values of PM 2.5 and SO2 from the idling of two batteries?
A. Yes, yes. There's a lot of -- there's a lot of sulfur dioxide that comes out of the stack, the combustion stack, because you have to heat these batteries continuously. You would still be heating them if they were on idle. I mean, I'm assuming you're talking about idling, and not shutting them down completely, but idling them.
Q. Correct.
A. But it would not take the same amount of heat or the same amount of fuel as it would be if you're actually making coke in the process, so there would be that decrease. And then the fact that there wouldn't be leaks and -- you know, those kinds of emissions would not exist at all.
Q. Circling back to the emissions inventory for a quick second, do we enforce -- under 2109, do we enforce any aspect of the emissions inventory? Do we enforce off of that information?
A. Other than the actual reporting? They're required to report their emission inventory, but we don't enforce off of the emission inventory, no.
Q. And with respect to enforcement, what do we enforce with respect to coke ovens?
A. Well, we enforce NESHAP, the NESHAP requirements. We incorporate them by reference. And our Regulation 2105, Section 21, contains all the specific coke plant regulations. And there are miscellaneous Article 21 Regulations that the plant is subject to just because plants are subject to them.
Q. Now, 2105, is that an opacity standard?
A. Many of them are. There is the hydrogen sulfide standard in coke oven gas that's being used as fuel, but the majority of them are opacity standards.
Q. Okay. Are you aware of a program called CITE, C-I-T-E?
A. I am.
Q. Could you explain to the best of your recollection what that program is about?
A. When I started in 1980, there was a lot of
excitement about this program. It's called Continuous Improvement to the Environment and it was a U.S. Steel program and they were very proud of it and they shared a great deal about it. Every employee -- what \(I\) was told was every employee took 40 hours of training on how their job specifically affected the environment and how they could work to improve the environment.

And they had other projects as part of this Continuous Improvement to the Environment Project. One that came of most interest was -- I think it was late 1980 's where they had a team. We had -- the company had a problem meeting their H2S in coke oven gas, the regulation that we just talked about.

The limit is 40 grains of hydrogen sulfide per 100 cubic feet of gas, and grain is a weight for loading. So, it's how much hydrogen sulfide that is in the coke oven gas that's used as a fuel everywhere at the three plants. And the standard at that time was 40 grains, and they had trouble meeting that 40 grains.

And so, as part of this CITE Program, they put together a task force, like a quality assurance group, a quality improvement group, which is what people now call it. People from the floor, people from the Gas Dispatcher's Office, managers, or whatever got
together, and they looked at every -- all aspects to see what they could do to lower that amount, so they can come within the limit of 40 grains because they kept on going above it.

The anecdote that I was told, and the numbers that we saw, is that they were so successful that within a few years they renamed the group the Under 20 Group to bring the grain loading below 20. So, this was an example of the CITE Program and the improvements of the CITE Program.

I don't know if it's in place at all. It would be very useful if this would to be improved upon and used again to involve all of the employees in improving the environment.
Q. Staying with that notion, you've had an opportunity to review the plan that U.S. Steel submitted in terms of their compliance with that two successful quarter requirement?
A. Right, the control plan.
Q. Do you recall the notation of the CITE Program in that document?
A. I think there's some -- I don't know specifically, but I know there's some reference to increased training of the employees, and I think that's where they refer to the CITE Program.
Q. Okay. And do you recall whether or not there was any contemplation of additional personnel to bring them into compliance?
A. Very specifically, there's discussion of additional personnel, yes.
Q. So, ultimately, the issuance of this

Enforcement Order, rather than cause a decrease of
employment, has caused an increase of employment, at least per the plan?
A. According to the plan, yes.
Q. Are you aware of the facility of Arsenal Middle?
A. I know of it. You're talking about the plant that's in Monessen. Arsenal Middle has several plants, but you're talking about Monessen, right?
Q. I'm sorry, yes. To be precise, the plant that's in Monessen?
A. Yeah.
Q. And by comparison, how big is that facility to Clairton?
A. I believe it's only one battery, as opposed to the 10 batteries in Clairton.
Q. So, substantially smaller?
A. Yes.
Q. Do you know if that facility has ever been in

\section*{hot idle?}
A. Yes. I was told it was in hot idle for about five years from 2008 or ' 09 to 2014.
Q. And it's currently in operation?
A. It's in operation.
Q. Would you know how many violations that --
well, let me back up. Are you aware of any
enforcement action involving the DEP versus Monessen,
that Monessen facility?
A. I don't know if it's DEP or EPA, but there
was a recent \(\$ 1.5\) million penalty against the company.
Q. Do you know how many violations were involved?
A. I believe it was about 300 , but I'm not sure exactly.
Q. Are you familiar with Eastman Chemicals?
A. Sure, that's one of our companies.
Q. Do you know if they've had a similar sized penalty?
A. I'm told that they had a million-plus penalty. Again, it was an EPA action, but yes.
Q. And with respect to Shenango, which was another coke facility in the area, do you know if any -- do you know what the highest penalty that they received from the Health Department?
A. I don't know the highest. I know there was one over a million dollars, and I know one that I was involved in was a \(\$ 600,000\) penalty.

MR. WILLIS: I want to go through some documents at this point, and this -- they do not have a copy of this, so I'm going to introduce this separately.

HEARING OFFICER SLATER: Okay.
By MR. WILLIS:
Q. But this -- could you take a look at that? Do you know what this is?
A. Well, this is our Chapter Nine Enforcement, but it is not complete. I believe that this is what the EPA posts on their website, and that includes whatever has been SIPed as a federal -- a federally enforceable rule and they mark what -- and they exclude things that were not SIP.

Not everything goes into a SIP. There are things like odor regulations that the Federal Government does not enforce. And so, they -- if we submit it to them, they would just reject it. They're not part of the SIP.

This is EPA's version of our Enforcement Chapter, which includes everything that is federally SIPed, 5 everything that is federally enforceable.
Q. How can you tell that this is the EPA version?
A. Because it has, "Not in SIP."
Q. Where are you looking at?
A. There's places, like, 2109.02, Remedies, Section Seven, says, "Not in SIP."

I also know that -- I was verified by my engineer because he pulls this down on a regular basis. Enforcement Orders in general -- 2109.03 is
Enforcement Orders. A is SIPed, B is SIPed, but A One through Three are not in SIP.
Q. I've got you. Could you read 2109.03A?
A. Certainly. "Whenever the Department finds, on the basis of any information available to it, that any source is being operated in violation of any provision of this article, including any provision of any permit or license issued pursuant to this article, it may order the person responsible for the source to comply with this article, or it may order the immediate shutdown of the source or any part thereof. The issuance of an order to address any violations, including of permit conditions, need not be proceeded by the revocation of a permit."
Q. Okay. And similarly, could you read 2109.04?
A. Just A?
Q. Just A.
A. Okay. "2909.04, orders establishing an additional or more restrictive standard. General. Whenever the Department finds, on the basis of any information available to it, that emissions of any source are causing or significantly contributing to the exceedances of any ambient air quality standard established by Section 2101.10 of this article at any location within the Commonwealth, that such emission violates -- that at such emissions violate the requirements of Article 2101.12 of this article relating to interstate pollution, or that such emissions may otherwise reasonably be anticipated to endanger the public health, safety, or welfare, they may order the person responsible for such source to comply with an additional or more stringent emission limitation than established by this article, or it may order the immediate shutdown of this source or any part thereof."
Q. Okay. Would you agree that those two portions are part of the SIP?
A. Yes, according to this, they are.
Q. Okay. And is it your understanding, that
based on the reading of that, that there's a
requirement to consider all information in the

\section*{universe of information?}
A. It says, "Whenever the Department finds, on the basis of any information available to it." So, yes.
Q. We were just talking about the emissions that you anticipate from door leaks from, in particular, Battery \(B\), the BTEX and benzene. Is that a public health hazard?
A. Yes. They are cancer causing chemicals; benzene, toluene, xylene, and ethylbenzene.
Q. And those are not currently being controlled by the bag house of Battery B?
A. No.
Q. Did we order, as a part of our Enforcement Order, the immediate shutdown of any batteries?
A. We did not.
Q. Did we condition a shutdown on any batteries?
A. We conditioned a possible shutdown -- or not a shutdown, no. An idling of a battery if things do not improve, yes.
Q. So, you're making a distinction between a shutdown and an idling?
A. Certainly. A shutdown is that you completely take this battery off line, and you take the gas off of it. That will pretty much destroy a battery. It

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cannot come back on.
Iding -- and idling has happened before. Idiing happened during the steel recession in 2009. Idling just says you cannot produce coke. You still heat the batteries, you keep them maintained, but you cannot produce coke with them.

MR. WILLIS: Okay. Thank you. I'm going to
offer this as an exhibit, ACHD Exhibit Four. HEARING OFFICER SLATER: Okay. Any
objection, Mr. Dausch?
MR. DAUSCH: NO.
HEARING OFFICER SLATER: All right. ACHD
Four is admitted.
MR. WILLIS: Okay. I'm going to move to what will be ACHD Five, unless it's in here. I'm looking at the November 17, 2016 NOV. Do you have that? MR. DAUSCH: No.
BY MR. WILLIS:
Q. Does that look familiar?
A. Let me make sure that I signed it. Yes, this would be the second quarter of 2016, and we talked about the quarterly emission penalties -- or
violations, and this would be for the second quarter of 2016.
Q. On the second page, the first full paragraph,
could you read that?
A. Starting with, "By this letter"?
Q. Yes.
A. "By this letter, the Department is not taking any actions specifically regarding any alleged failures to meet any requirements regarding pushing or combustion stacks as determined by a Continuous Opacity Monitoring System or soaking on Batteries 1, 2, or 3. Such actions are taken separately and through provisions of the March 24, 2016 Consent Judgment."
Q. So, this NOV specifically carves out violations that are contemplated under the Consent Judgment?
A. Yes.
Q. Okay. About five -- four sheets in -- on the fifth sheet, it begins, "Notice of Violation Settlement Offer, January 25, 2017." Are you familiar with this one?
A. Well, this would be the third quarter of 2016 penalty -- quarterly penalty assessment.
Q. Okay. And similarly, this one carved out the violations regarding the March 24,2016 Consent Judgment?
A. Yes. It's on the second page of that.
Q. Okay. At the bottom, there should be a Bates Number 13954, and it begins, "Notice of Violation Settlement Offer, June 12, 2017"?
A. Yes.
Q. Would you agree that this is attributable to the fourth quarter of 2016?
A. It is the fourth quarter penalty assessment.
Q. Okay. And again, does this carve out any penalties attributable to the 2016 Consent Judgment?
A. It is the same paragraph, yes.
Q. Okay. Bates 13960, "Notice of Violation Settlement Offer, July 5, 2017"?
A. This is the first quarter of 2017.
Q. Okay. And similarly, does this carve out any violations attributable to the 2016 Consent Judgment?
A. The same paragraph is in this assessment.
Q. Okay.
A. And one more?
Q. One second. Would you -- let's flip back to 13954 for a second. Would you agree that this was issued in June of 2017?
A. That's what it says, yes.
Q. And this was attributable to the fourth quarter of 2016?
A. Yes.
Q. And so, at the time this was calculated, it was the subsequent year to the actual violation?
A. Yes. It takes a while to accumulate, to assess, to review, to process, and to put this thing together. So, it does take quite a while to get from the end of the quarter to when the assessment is put together.
Q. Okay. Now, we will move forward to 13967 , the October 30, 2017, Notice of Violation with penalty. Is this also attributable to the second quarter of 2017?
A. Yes, it is.
Q. And does it have the same language carving out the penalties attributable to the 2016 Consent Judgment?
A. It does.

MR. WILLIS: Okay. We're going offer this as ACHD Six.

HEARING OFFICER SLATER: I had five.
MR. WILIIS: Five?
HEARING OFFICER SLATER: Yeah.
MR. WILLIS: Okay.
HEARING OFFICER SLATER: Any objection? MR. DAUSCH: No, no objection. HEARING OFFICER SLATER: Okay. ACHD Five is
admitted.
MR. WILLIS: Thank you. Do you guys have
this?
MR. DAUSCH: It's Number Two.
MR. WILLIS: I'm sorry?
MR. DAUSCH: It's Number Two in the binder.
MR. WILLIS: Oh, it's in here?
MR. DAUSCH: Yeah.
MR. WILLIS: Okay. So, 72?
MR. DAUSCH: NO, TWO.
MR. WILLIS: Oh, Number Two. Two is the --
HEARING OFFICER SLATER: So, Tab Two?
MR. WILLIS: It's Tab Three. Yeah. It's
already in there under Three.
HEARING OFFICER SLATER: Oh, Three.
BY MR. WILLIS:
Q. I believe we discussed this one earlier. You indicated that this was the first one that we applied the 2018 Civil Penalty Policy against U.S. Steel?
A. The -- this is the third -- yes, it is.
Q. How much was the penalty for in that?
A. In this document, it's \(\$ 490,125\).
Q. So, almost a half million dollars?
A. Yes.
Q. Just for that one quarter, correct?
A. Yes, that is correct. And this is the one we reduced the penalty for.
Q. I'm going to move to another document. Could
you take a look at that document please? Does that
document look familiar to you?
A. Yes. This is the asbestos violation.
Q. Okay.
A. The non- -- the reporting violations for
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three others -- this document -- unless you have those

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included in here.

HEARING OFFICER SLATER: Is this document in one of the binders?

MR. WILLIS: No, it's not.
HEARING OFFICER SLATER: Okay.
MR. WILLIS: So, it's going to be an ACHD.
HEARING OFFICER SLATER: All right. I'll say ACHD Six.

MR. WILLIS: Thank you. BY MR. WILLIS:
Q. If you would look to Paragraph 12 , do you see that?
A. Yes.
Q. What's the date of the allegation in Paragraph 12?
A. That the actions were taken February 1st
through February 5th, 2016.
Q. Okay. And yet, with respect to this order, we used the 2018 Civil Penalty Policy?
A. Yes.
Q. And U.S. Steel appealed this order?
A. They did, yes.
Q. And U.S. Steel withdrew its appeal of that order?
A. They did.
Q. So, this Civil Penalty Policy was paid?
A. I believe that the penalty -- the final
penalty was different. There were some discrepancies on some of the violations on this. I believe that it was slightly different than this, but the penalty itself was paid, yes.
Q. Okay.
A. Well, it was put into escrow during the appeal, and now the appeal has been withdrawn.

MR. WILLIS: Okay. I understand. I'm going to apologize in advance because of the way we produced our documents, they were -- I was trying to save a few trees and did everything on -- you know, two sided. The consequence is that there's a carryover from a previous document that should not be included for the next exhibit. This one starts, technically, at 14034,
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but because it was double-sided, there is an
extraneous document that has no bearing on this
particular piece of evidence at 14033.
MR. DAUSCH: Can I see that?
MR. WILLIS: Yeah.
HEARING OFFICER SLATER: DO we need to cross
anything out, or should we just ignore it?
MR. WILLIS: I was going to ask to ignore it
because I have no use for that information. I don't
know if -- if they object, I have no problem, and then
we can copy -- get fresh copies of just that front
page.
MR. DAUSCH: My suggestion would be that we
continue right now, but at some break we correct the
exhibit to remove the page just so the record is
cleaner.
HEARING OFFICER SLATER: Sure. That's fine
with me.
MR. WILLIS: I agree.
HEARING OFFICER SLATER: So, let's mark this
as ACHD Seven.
MR. WILLIS: Seven, and note that we need to
correct it to remove --
HEARING OFEICER SLATER: Is there any
objection to the admission of ACHD Six?

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MR. DAUSCH: Not -- no. Six, no.
HEARING OFFICER SLATER: Okay. ACHD Six is
admitted. What date is that Enforcement Letter?
MS. GRAHAM: It says the 13th of June.
HEARING OFFICER SLATER: Okay, thank you. BY MR. WILLIS:
Q. If you turn to 14037, Paragraph 15, do you see that?
A. Yes.
Q. Is it fair to say that this Enforcement Order relates to violations which occurred in 2015?
A. Partially. It's beyond '15, but it includes 2015.
Q. Okay. And did we employ the 2018 Civil Penalty Policy for that?
A. We did, yes.
Q. Okay. And again, this is one of the orders that U.S. Steel has appealed this year?
A. They did appeal it. The money was put in escrow. They have since withdrew their appeal.

MR. WILLIS: Okay. I don't know if we need to make an exhibit out of something that's already part of the record, but I would like to refer to it. This is the County's Brief in Opposition to Appellant's Position to Stay.

HEARING OFFICER SLATER: We can mark it as an exhibit just to --

MR. WILLIS: Just for the sake of marking it as an exhibit?

HEARING OFFICER SLATER: Yeah.
MR. WILLIS: Okay. There's nothing different
there.
HEARING OFFICER SLATER: Okay, so, ACHD Eight.

MR. WILLIS: Eight, and there's this too.
HEARING OFFICER SLATER: And how is that
labeled again?
MR. WILLIS: I'm sorry?
HEARING OFFICER SLATER: What was the full
title of the brief?
MR. WILLIS: It's ACHD's Brief in Opposition to Appeal's Petition to Stay.

HEARING OFFICER SLATER: Oh, okay. Thank you.
BY MR. WILLIS:
Q. Are you familiar with that document?
A. I am familiar with it, yes.
Q. Okay. If you could turn to Page 14115?
A. Yes.
Q. Can you describe what that represents?
A. This was a letter from Coleen Davis of U.S. Steel to Mr. James Thompson, who was the Head of the Air Quality Program at the time, dated February 27, 2009. The subject is, "Intent, to shut down their Batteries 13, 14, and 15 and change status to hot idle."
Q. What's your understanding of what the intent of that letter was?
A. There was a recession going on. There was low production, and so the company had decided to -or we were told that the company had decided to lower production on some of the batteries and take others down to a hot idle and take them off of the production line. So, again, keep the batteries hot and keep some fuel going to them, but not to produce.
Q. And on the page directly after that, could you explain what that is?
A. This is March 13, 2009, a similar letter. It's the same person's intent to shut down the \(B\) Battery and change status to hot idle.
Q. To your understanding, were those batteries ultimately put on hot idle?
A. I believe they were, yes.
Q. Okay. If you'd turn to 14119?
A. I'm there.
Q. What's the date of that document?
A. June 26, 2009.
Q. What's the intent of that document?
A. It's a letter with the same persons involved, and the subject is, "Intent start up the B Battery from hot idle status."
Q. Okay. And then the second paragraph, would you read that please?
A. "B Battery was idled on April 6, 2009, due to economic conditions of the United States Steel Corporation. The first oven is scheduled to be charged on June 29, 2009, at approximately 10:00 p.m. with the first coke scheduled to be pushed on July 1, 2009."
Q. Thank you. Would it be fair to say that that's an approximately three-month gap in which that battery was on hot idle?
A. Yes.
Q. And the subsequent document of 14121, could you read that second paragraph in that document?
A. It's December 31, 2009, "Intend to start up Batteries 13, 14, and 15 from hot idle status."

And which paragraph would you like me to read? Q. The second paragraph, please.
A. "Batteries were idled on March 16, 2009, due
to economic conditions of United States Steel
Corporation. The first oven is scheduled to be charged on January 11, 2009, starting with the 13 Battery."
Q. That's approximately nine months; is that right?
A. Yee, slightly over.
Q. Okay. To your recollection, do you recall hearing any reports of breakdowns with respect to those batteries following their restart?
A. I don't recall any. You have to be very careful when you're bringing them back up again, but don't recall any breakdowns because of them bringing them back up.
Q. Okay. The next part of that of 14123, have you seen that document before?
A. Yes, I have.
Q. What is that document?
A. That's a Safety Data Sheet. This one is for clean coke oven gas.
Q. Okay. Could you -- all right. Could you look to Page Four out of Eight of that, and specifically 14126, Section 11?
A. Okay. Section 11 is the toxicological information.
identify what the hazards are as stated?
A. Acute hazard is harmful to swallow. A germ cell mutagenicity may cause genetic defects. Carcinogenicity may cause cancer, may damage the fertility of the -- of the unborn child, may cause drowsiness or dizziness, can cause -- causes damage to the lungs, causes damage to blood and blood forming systems through prolonged or repeated exposure, and may displace oxygen and cause rapid suffocation.
Q. And on the following page, 14127, specifically \(F\), where it says, "Benzene"?
A. Benzene. You're going to make me say this word again. No germ cell mutagenicity data available for clean coke oven gas as a mixture. The following germ cell mutagenicity information was found for the component benzene. Chronic overexposure can cause chromosomal aberrations in animals and humans, also may induce a sister chromatid exchange and micronucleate both in --

HEARING OFFICER SLATER: Ms. Graham, I'm
sorry. I'm just going to interrupt you for a second. MS. GRAHAM: Yes.
HEARING OFFICER SLATER: I just want to
remind counsel and witnesses to speak more slowly,
just because I know there's a lot of technical
information and a lot of terms that we may not all be familiar with, especially to ensure we have a clear record.

MS. GRAHAM: Would you like me to start again or just --

HEARING OFFICER SLATER: Yeah, start again.
I shouldn't have stopped you mid-sentence.
MS. GRAHAM: That's fine. I'll try that word again. Okay. "Benzene. Chronic overexposure can cause chromosomal aberrations in animals and humans, also may induce sister chromatid exchange and micronucleate both indevo (phonetic) and invitro. Benzene overexposure has shown to induce -- I'm going to spell this because I have no idea ---A-N-E-U-P-L-I-D-Y in dividing cells, classified as a potential germ cell mutagen." BY MR. WILLIS:
Q. Okay. Thank you.
A. I should note that this is the clean coke oven gas and not the raw coke oven gas. It's significant.
Q. And this is a document that has U.S. Steel's logo and name at the top of this document on 14123?
A. It does.
Q. Is that correct?
A. Yes.
Q. Okay. Moving to 14131, could you explain what this document is?
A. This one is the raw coke oven gas, again U.S. Steel Corporation.
Q. Okay. Could you read the hazard statement?
A. "Extremely flammable gas. May displace
oxygen and cause rapid suffocation. May cause genetic defects. May cause cancer. May damage fertility of the unborn child. Toxic if inhaled. Causes skin irritation. Causes severe eye irritation. Causes central nervous system depression, respiratory irritation, drowsiness, or dizziness, and damage to lungs, liver, and blood cells.

Causes damage to the heart through prolonged or repeated exposures. Causes damage to blood forming tissues and central nervous system through prolonged or repeated exposure."
Q. Thank you. If you could turn the page to 14132? What are we looking at here, if you know?
A. This is the emission inventory report of U.S. Steel into the Pennsylvania System, Emission Inventory System.
Q. Who puts this data into the State Inventory System?
A. The company themselves.
Q. Okay. Is coke oven emission a part of that inventory?
A. Yes.
Q. Chromium, is that a part of the inventory?
A. It is.
Q. Ethylbenzene?
A. It is.
Q. Ammonia?
A. Yes.
Q. Methochloride chlormethine -- chlormethine?
A. Let me look for it. Yes.
Q. Methacrylates?
A. Yes.
Q. That's \(\mathrm{M}-\mathrm{E}-\mathrm{T}-\mathrm{H}-\mathrm{A}-\mathrm{C}-\mathrm{R}-\mathrm{Y}-\mathrm{L}-\mathrm{A}-\mathrm{T}-\mathrm{E}\). Naphthalene?
A. Yes.
Q. Toluene?
A. Yes.
Q. Xylenes?
A. Yes.
Q. And that's \(X-Y-I-E-N-E-S\). Okay. I'm moving
to the documents that are listed as Exhibit D,
starting on 14134, and they go to 14147. Do you know
what these are?
A. These are complaints. Citizens can call in a complaint or file a complaint online, and these are a selection of the complaints that we've received.
Q. Okay. Could you turn to 14139 , and could you read that first complaint into the record? You can start where it says, "Complaint," where it's bolded.
A. "Complaint. Subject, Air pollution in South Park, 12/2/2017 at 10:30 a.m. Comment, extreme air pollution from Clairton Works (smell like coke ovens) in South Park Township at 1114 -- oh, this is an address -- at 10:30 a.m.

I used to work in a steel plant and know the coke oven smell. Gas is in the lower areas this morning, and it's being pushed down by the air probably because there is little westerly wind, so the clairton pollution is just hanging around the area and not being dispersed. U.S. Steel needs to improve the pollution control on the new \(C\) Battery and should be shutting down all the old batteries." MR. WILLIS: Thank you. I'm going to show you another document, and I have passed this along to you, but I don't know where it is. This is that -HEARING OFFICER SLATER: Is there any objection to Exhibits ACHD Seven and ACHD Eight.

MR. DAUSCH: He introduced the brief, and I have no objection. HEARING OFFICER SLATER: And Seven is the
June 13, 2018 Enforcement Order. MR. DAUSCH: No objection. HEARING OFFICER SLATER: All right. ACHD
Seven and Eight are admitted.
BY MR. WILLIS:
Q. We are going to move to what will be ACHD Nine. Is this document -- is this document familiar to you?
A. Yes, it is.
Q. Do you know what it is, or could you tell us what it is?
A. This was a -- a -- I don't know if you'd call it a promotional brochure or a manual report of the CITE Program at U.S. Steel, and it's -- the first sentence says it's the 1994 U.S. Steel Clairton Works Environmental Report. And so, that's what it is.
Q. So, this is coming from 1994, and you've already described your familiarity with the program. Is there anything -- take a minute, if you would, just to satisfy yourself if your understanding of the CITE Program is in line with what is in this publication?
A. This is as I remember it, yes.
Q. Okay. And if you could turn to 14631? If you could read the portion to yourself regarding the sulfur dioxide reduction? There's a segment there, and it goes onto the subsequent page. Just to the bottom paragraph there.
A. Okay.
Q. Based on that paragraph on Page 14632, is it fair to say that U.S. Steel, on this publication, acknowledged that the Liberty Borough Monitor -- that Clairton had an impact on that monitor with respect to 502?
A. Yes, it is clear. They were taking pride in the decrease, the work that they've been doing and how it affected the Liberty Monitor.

MR. WILLIS: Okay. Thank you. I would move for the admission of that. Where are we, Nine? HEARING OFFICER SLATER: Yeah, ACHD Nine. Any objection?

MR.DAUSCH: No objection.
HEARING OFFICER SLATER: All right. ACHD
Nine is admitted.
MR. WILLIS: Again, the same situation with the next one, which would be ACHD 10. Unfortunately, there's an extraneous email that forms the cover of it, but it actually begins on 13498. So, this will be
another one that, if we get it through, will require a little cleaning up.

HEARING OFFICER SLATER: Yeah. We can take
care of that either, you know, after the hearing
today, or before we start tomorrow we can do that. MR. WILLIS: Okay.
HEARING OFFICER SLATER: Or during a break
tomorrow.
MR. WILLIS: Is this, what, Number 10 ?
MR. DAUSCH: Yes.
HEARING OFFICER SLATER: Yes.
BY MR. WILLIS:
Q. Does that look familiar?
A. Yes, it does.
Q. Could you tell me what that is?
A. We occasionally have interns that come in during the summer to do specific research or to assist us in different things. This summer, we had a woman. She's Chinese, but she goes by the name of Julie, so for now, I'll call her Julie. Her name is \(J-I-N-G-H-U-I\) and her last name is \(J-U\), but she went by Julie.

And so we asked her -- just handed her a bunch of sulfur -- hydrogen sulfide data and said, "See what you -- what are your observations? Look at the data,
look at the wind conditions, and see what you can make from this."
Q. Okay.
A. This was her final report. It wasn't a complete study. Tony Sadar (phonetic), her supervisor, is still finishing and putting some polishing on this and making some final changes and adding data to it, but it was what she provided at the end her internship.
Q. I'm going to ask you just generally, because it's a lot of charts and it's a lot of data -- I'm assuming, and correct me if I'm wrong, that you have had an opportunity to read this data or this proposal or this project when she completed it?
A. Yes. She gave a presentation and, plus, we had the project itself.
Q. Did you attend that presentation?
A. I did.
Q. So, you understand the contents.
A. Yes.
Q. Okay. What can --
A. Not every detail, but I do understand the contents.
Q. With respect to SO2 at the Liberty Monitor, what was your take-away from this study, for the lack
of a better word?
A. Well, she was studying hydrogen sulfide, not SO2.
Q. Okay.
A. So, this would not be a sulfur dioxide study. This was a hydrogen sulfide study.
Q. I see.
A. This was looking at -- because of the odor issues and our concerns with the -- exceeding the State standard, we were looking at hydrogen sulfide in this study.
Q. There's a lot of SO 2 data in here, was that reviewed at all? And there's PM2. 5 was well. Was any of this reviewed by you?
A. It was not reviewed by me. Again, Tony Sadar was the supervisor, so he would have reviewed the data on the particulate matter and sulfur dioxide parts.
Q. Okay.
A. Okay. The primary purpose of this was a hydrogen sulfide study, so what she was looking at was hydrogen -- sulfur dioxide versus hydrogen sulfide in some of these and looking at the same -- is she getting the same wind direction over time from sulfur dioxide as well as H2S, and then later also benzene and H2S. Although she only got a year into looking at
benzene -- but that's the part that Tony was finishing up.
Q. Okay. Could you turn to 13529?

MR. DAUSCH: Mr. Slater, at this point, I'm going to object to this exhibit, just given the testimony we have thus far of this witness that -- she wasn't involved in reviewing any of the underlying data, and it appears that we're talking about an incomplete study that hasn't been finished by a graduate intern student from a witness who wasn't involved in this. So, at this point, I think there's no foundation and there's no -- it's complete hearsay. HEARING OFFICER SLATER: Mr. Willis? MR. WILLIS: Well, I would say it's -- the foundation is kind of irrelevant at this point. This is -- this is relevant information concerning SO2. And in particular, I was going to focus the wind Rows Diagrams that are included in here that would pinpoint the location and source of SO2 hitting that Liberty Monitor.

If they're willing to concede that the
Liberty Monitor is impacted by Clairton Coke Works, that's fine. I could live without this exhibit.

HEARING OFFICER SLATER: Would you be willing to make that concession, Mr. Dausch?

MR. DAUSCH: No. We're not stipulating to any of the facts. All I'm doing at this point is objecting to an exhibit that has zero foundation, it's hearsay, it's incomplete, and the witness who is talking about it had no involvement in it.

HEARING OFFICER SLATER: I'm going to
overrule Mr. Dausch's objection, but I will take it as to the weight. So, I'll allow it to come in, but I'll consider your -- the objections you've made as to how -- as to the weight that the document carries. So, ACHD 10 is admitted.

MR. WILLIS: I have no more evidence. Thank you.

HEARING OFFICER SLATER: Any more questions on direct for --

MR. WILIIS: No more questions on direct.
Are we going to take our afternoon break?
HEARING OFFICER SLATER: Yeah, we can take a quick break.
(The hearing recessed at 2:58 p.m. and
reconvened at \(3: 10\) p.m.)
HEARING OFFICER SLATER: Let's go back on the record. Mr. Dausch, did you want to -- did you have some questions for Ms. Graham?

MR. DAUSCH: Yes.

BY MR. DAUSCH:
Q. Ms. Graham, I want to take a step back. When
we're talking about the Federal Regulations that apply
to Clairton, sometimes we call those NESHAP
Regulations?
A. Yes.
Q. And when we talk about the county's

Regulations, sometimes we call them Article 21
Regulations?
A. Yes.
Q. And other times we refer to them as SIP

Regulations?
A. Most are SIP Regulations, but Article 21 is more accurate.
Q. Okay. And the County enforces the Federal Requirements and the Article 21 Requirements, correct?
A. We do, yes.
Q. There are a lot of emission sources at Clairton, other than the batteries, correct?
A. There are.
Q. And Mr. Kelly testified a little bit about the operating permit that exists at clairton. Wexe you here for that?
A. No.
Q. Okay. Are you aware of the Title Five Operating Permit for Clairton?
A. Yes.
Q. Okay. Could you look at Exhibit 30? And,

Ms. Graham, would this be -- Exhibit 30 would be the
Title Five Operating Permit at Clairton?
A. It is.
Q. And this is just issued by the County Health Department?
A. It is.
Q. And this is a comprehensive document that's supposed to include both the Federal and the county Regulations that apply at Clairton?
A. Yes.
Q. But it puts them all in one spot?
A. Yes.
Q. In this document, Page Five there's a table. Let me know when you see that table?
A. Okay.
Q. Do you see that?
A. Yes.
Q. And this table lists different sources that are at Clairton, correct?
A. Yes.
Q. And all of these sources aren't subject to
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the Enforcement Order; is that fair?

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A. No, they are not.
Q. Right. The Enforcement Order relates to the batteries?
A. Correct.
Q. And the batteries are the first several sources that are listed on this table that starts on Page Five; is that fair?
A. That is fair.
Q. Okay. The other sources are not at issue in this Enforcement Order?
A. Not in this Enforcement Order, yes.
Q. And in the Enforcement Order, it's not every emissions point at the batteries that's at issue? Let me ask it this way.
A. It might be most of them. I'm not sure which.
Q. The Enforcement Order only contains alleged violations for certain of the emission points at the batteries?
A. Yes.
Q. It doesn't include all of them?
A. It includes all -- I believe it includes all violations, except for those that are already in Enforcement Orders.
. The Enforcement Order that we're talking about that's the subject of this appeal, doesn't deal with pushing emissions from the batteries?
A. I don't think so, no.
Q. And it doesn't deal with soaking emissions

\section*{from Batteries 1, 2, and 3?}
A. No.
Q. And it doesn't deal with the battery stack emissions, correct?
A. The battery stack emissions are included in this enforcement.
Q. They are?
A. The battery stack emissions, yes.
Q. The COMS?
A. The -- I mean in the evaluation of if the

\section*{batteries are improving.}
Q. I'm talking about violations.
A. Oh, no. No, they are not.
Q. Okay. There's no asbestos violations in the Enforcement Order?
A. No asbestos violations.
Q. Has the County ever shut down a plant that was 98.152 percent compliant?
A. No. The County has only shut down one plant.
Q. You had mentioned in your direct testimony --
there was testimony about different administrative
orders that were issued over different quarters?
A. Yes.
Q. One of those that you testified about was Exhibit Three. Would you look at that please?
A. Okay.
Q. Are you familiar with this document?
A. I am.
Q. This is an administrative order that relates to the third quarter of 2017?

\section*{A. Yes.}
Q. On the second page of this exhibit, there's a paragraph. It's the third full paragraph down.

It says, "By this order, the Department is not taking any actions specifically regarding any alleged failures to meet any requirements regarding pushing or combustion stacks as determined by a Continuous Opacity Monitoring System or soaking on Batteries 1, 2 , and 3. Such actions are taken separately through provisions of the March 24, 2016 Consent Judgment."

Do you see that?
A. Yes.
Q. And so I understand your testimony earlier, the reason that this is put in is to make clear that the subject matter of this administrative order is to
cover the other fugitive emissions points that aren't covered by the 2016 Consent Judgment?
A. Yes.
Q. Two criteria pollutants are identified in the Enforcement Order, SO2 and PM 2.5, correct?
A. Correct.
Q. For SO2, the County recently finished a State Implementation Plan; is that correct?
A. Yes.
Q. And you're familiar with that document?
A. I am.
Q. I want to direct your attention to U.S. Steel Exhibit 17. Are you familiar with this document?
A. I am.
Q. Is this the State Implementation Plan for SO 2 that was submitted by the County on September 14 , 2017?
A. It certainly looks like it, yes.
Q. Okay. And this relates specifically to SO2, correct?
A. It does.
Q. In this document, on Page 12, there are some tables. At the top left, it says, "Table 3-3." Are you there?
A. Yes, I am.
Q. Okay. When the County is preparing this SIP, you want to make sure that the information that's ultimately being submitted to the EPA is as good and accurate as it can be; is that fair?
A. Yes.
Q. And you want to be extra diligent when you're reviewing emissions data before you prepare this plan?
A. We do the best we can, yes.
Q. Okay. With respect to Table 3-3, that table includes every SO2 emission source at Clairton, correct?
A. As far as we can tell, yes.
Q. Okay. Emission points at Clairton that are not contributors of SO 2 don't show up?
A. Are unlikely to show up, yes.
Q. Okay. There's no battery door leaks
identified in this table, correct?
A. There are none specifically listed.
Q. Okay. When the County develops a SIP, they discuss the different requirements with the source to make sure they're achievable, correct?
A. Yes.
Q. You want to make sure that whatever requirements are in the SIP are achievable if you're going to submit it to EPA?
A. It goes through our Planning, yes.
Q. All right. You wouldn't put things that are unreachable in a SIP; is that fair?
A. That's fair.
Q. With respect to the B Battery Door Leak

Standard, the Department never discussed that with
U.S. Steel before putting it in the Enforcement order?
A. No.
Q. The SIP sometimes includes adjusted regulations; is that correct?
A. Yes.
Q. What's the process to enact a regulation with the County?
A. A regulation goes through -- it sometimes goes through a subcommittee where we meet with both the company and with citizens to discuss the need for a regulation change and the -- where we plan to go with it. And then we -- you know, the advisory committee goes to the Board of Health to ask for permission to go out to public comment with this regulation. We receive public comment over 30 days and a public hearing.

And then the results -- we respond to all comments, and we take them back to the subcommittee, the Air Advisory Committee, and Board of Health for
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final approval. If it's a regulation change, then it
also goes through County Council for their approval
and the County Executive's signature.
Q. So, can we agree that enacting a regulation
involves a thoughtful and careful process?
A. Certainly.
Q. And that same process wasn't gone through for

``` the B Battery Door Leak Standard; is that fair?
A. Yes. That was not a regulation, so we did not go through a regulation process.
Q. You mentioned in addition to SO 2 , the other criteria pollutant identified in the Enforcement order would be PM or PM 2.5, correct?
A. Yes.
Q. There's been no study to determine U.S. Steel's emissions have caused the Liberty Monitor to increase for PM 2.5 since 2015; is that fair?
A. A definite study, no. But there's been a lot of evidence, that -- yes, that it has influenced.
Q. I'm asking about studies.
A. Well, it depends on what you call a study. I mean, we -- we are in the process of putting together a fine particulate SIP, and that is essentially a study of what is affecting that monitor and the area around it and what is the best controls for it. So, I

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would say yes, that there is a study because that's what the SIP is, a plan based on our analysis.
Q. Do you remember a few weeks ago you had your deposition taken in this case?
A. Yes.
Q. Do you remember you were in my conference room downtown?
A. Yup.
Q. And you were under oath then, just like you're under oath now?

\section*{A. Yup.}
Q. All right. You had to tell the truth, the whole truth, and nothing but the truth; do you remember that?
A. Yes.
Q. Okay. I have your deposition. It's in the binder, Tab Two. I'll point you to Page 43, please.
A. Okay. Is this the right tab?
Q. It's Tab Two. It's in front of you.

MR. WILLIS: Do you have another copy? Page?
MR. DAUSCH: Forty-three.
BY MR. DAUSCH:
Q. On Line 16, I asked you a question, and it says, "I understand that. I think my question was has there been any specific study on the emissions at U.S.
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Steel Clairton to determine definitively that those
emissions have been the cause of the Liberty Monitor
increasing for PM 2.5 since 2015?"
Your answer, "I'm not aware of any study that --
specifically, as you're asking, no."
Did I read that correctly?
A. Yes.
Q. Can we agree that the air is getting better,
the air quality?
A. Over -- over time we've had some decreases in
the past several years, so degradation in the past
several years.
Q. And you're involved, on occasion, when there
are media requests about air and different pollutants
to the County, correct?
A. Yes.
Q. Can you look at Exhibit 29 please? One of those requests came earlier this year from a Public Source Interview, do you recall that?
A. I've had several requests from Public Source. I'm not sure which one you're talking to.
Q. Okay. Well, I want to talk about the one that's referred to in the email that's Exhibit 29. You're familiar with Mr. Scarpino, correct?
A. Yes.

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Q. And there are occasions where Mr. Scarpino will ask you or your colleagues about air emissions information that's distributed to the public to make sure it's accurate, correct?

\section*{A. Certainly, yes.}
Q. I want to talk about the email that he sent to you about an interview that was given by the County. Do you remember this email?
A. No, I don't.
Q. Okay. One of this things that was discussed in this email to you is \(H 2 S\), and you talked a little bit about H2S in your direct, correct?

\section*{A. Yes.}
Q. And it says -- for H2S, it says -- and it's the first sub-bullet point that's hollow. Do you see that?

It says, "State Standard, not Federal Odor/Nuisance Standard"? Do you see that?
A. Yes.
Q. The next bullet point, "H2S is not tied to public health." Do you agree with that?
A. At the levels we measure, it is not connected to public health, yes. It is a nuisance.
Q. Yeah. And the third indented bullet point says, "Multiple sources, water treatment facilities,
landfills, etcetera can emit H2S." Do you agree with that statement?
A. I do.
Q. A few bullet points down, there's another indent. It's a full filled in square. Do you see that?
A. Yes.
Q. In Mr. Scarpino's interview with Public Source, "Remember, there were discussions about extensive repairs to the batteries at Clairton. Explain the Consent Agreement."

That would have been the 2016 Consent Judgment, fair?
A. Right.
Q. And there were extensive repairs to the batteries at Clairton following that 2016 Consent Judgment, correct?
A. I believe so.
Q. Okay. The next bullet point, "Will absolutely have an impact on H2S at Clairton." Do you see that?
A. Yes.
Q. And what he's referring to is the extensive repairs at the batteries at Clairton will have -- will absolutely have an impact on H 2 S ; is that right?
A. Yes.
Q. And you agree with that statement?
A. Yes. Although the 2016 action was because we were seeing visible emissions coming out of the stacks, and that means the walls are breaking through. There's problems at the walls, so the Consent
Agreement was to repair those walls. And so, that
should increase -- decrease the amount of H2S in the stacks themselves.
Q. Right. And there's been an aggressive plan to repair those walls at the ovens; is that correct?
A. As part of the agreement, yes.
Q. Still with respect to H 2 S , if you move down to the next bullet point that's the hollow circle, "Uncertainty, though, of where the smells are coming from. Could be from multiple sources."

Do you remember discussing that with
Mr. Scarpino?
A. Not specifically, though we have complaints throughout the county for H2S.
Q. Right.
A. That was probably part of that.
Q. And there's no H2S modeling that the County's done to date?
A. Correct.
Q. And at the very bottom, the second hollowed out circle, "Air quality gets better every year. It continues to improve. Still have a problem, but data shows how far we've come in 10 years."

Do you agree with that statement?
A. Yes, certainly.
Q. I want to switch gears and talk a little bit about the Federal NESHAP Regulations. Those were developed to address hazardous air pollutants, correct?
A. That is correct.
Q. Hazardous air pollutants is in the NESHAP name, right?
A. Correct.
Q. And hazardous air pollutants would be things like the coke oven, the benzene, or the BTEX that you mentioned earlier, correct?
A. Yes.
Q. And the Department enforces these
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regulations?

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A. Correct.
Q. NESHAPs were developed through work groups that included the County?
A. Indeed.
Q. Were you part of the NESHAP developments?
A. I was not.
Q. There are inspectors at the Clairton Plant every day throughout the year inspecting for the NESHAP Requirements, correct?
A. That is correct.
Q. And they're from a company called Karamida?
A. Yes.
Q. And these inspectors follow a method called 303?
A. Yes.
Q. And that's a Federal Inspection Method, correct?
A. Correct.
Q. The County uses the Karamida Inspections not just for Federal Requirements, but also for its State Article 21 Requirements?
A. To some extent, yes.
Q. To what extent does it not?
A. I'm not sure exactly, but there -- where we differ, we ask them to keep records for -- and we use their data to compare against our regulation.
Q. And when we say hazardous air pollutants, that's the same things as when somebody would say an air toxic?
A. Yes.
Q. Okay. So, air toxic is the same thing as a hazardous air pollutant?
A. Correct.
Q. There was no analysis of what effect there would be on hazardous air pollutants as a result of compliance with the Enforcement Order, correct?
A. There was not a measured analysis, no.
Q. You, with your counsel, talked about smell complaints that came from Clairton. Do you recall that?
A. Yes.
Q. And you're aware that the County has an odor regulation in Article 21 ?
A. We do.
Q. As part of that odor regulation, when there are compliants like the ones that we looked at, the County goes out and does an investigation, correct?
A. We try to do whatever's practical. We don't always go out, but, yes, we try to.
Q. Does the County take those complaints seriously?
A. We do.
Q. Okay. And when it received those complaints, did it do investigations?
A. We have when we can. Again, odor is very
fleeting. Often times, by the time we get there, especially someplace that's an hour's drive away -- by the we get there, the odor is gone. But we've done investigations, you know, at times for different plants or different odors trying to identify where they come from and what we can do to resolve them.
Q. And all of the investigations that the county did, none of those ever resulted in any type of violation alleged against U.S. Steel Clairton; is that fair?
A. There's no recorded violations. Our inspectors have noticed odor issues, but we have not recorded a violation.
Q. And there are no alleged odor violations in the Enforcement Order that's the subject in this appeal?
A. There are not.
Q. The baseline calculation -- I'm going to switch topics and talk about the baseline.
A. Well, before I go there, let me just talk a little bit about the odor enforcement. Because of the way we enforce the odor regulation, we require three non-related persons to complain and our inspector to read it at the same time. So, it is a very difficult -- odor is a very difficult regulation for us to go
through enforcement too. So, that's why quite often
we don't enforce the odor regulation, but we do try to investigate and resolve it in other means.
Q. I want to talk about the baseline calculation that's in the Enforcement Order. You're familiar with that, correct?
A. I'm familiar with it.
Q. And in very general terms, what the

Department says is that we have to look at U.S.
Steel's baseline calculation of compliance percentages for the first quarter of 2018 for the batteries, correct?
A. Correct.
Q. And that would include both fugitive emissions points and battery stack compliance, correct?
A. Yes.
Q. Half would be battery stack compliance, and half would be fugitive emissions points, correct?
A. That's correct.
Q. And it would include fugitive emissions points where there were no violations in the Enforcement Order?
A. Yes.
Q. And can we agree that not all exceedances or
alleged violations would have the same impact to the ambient air?
A. That would be fair.
Q. Okay. And we saw that, for example, when we looked at the table in the SIP, and you could see different sources have different impacts on ambient air; is that fair?
A. Well, what we looked at was the emission inventory -- not necessarily the impact, but that would be a fair statement.
Q. And different sources have different standards, correct?
A. Yes.
Q. And not all of the batteries have the same standards on them for fugitives, correct?
A. No, they do not.
Q. For example, --
A. Newer batteries do have tighter limits than the older batteries.
Q. Correct. And so, newer batteries, like the \(C\) Battery, would have tighter, more stringent limits than the older batteries at Clairton?
A. Yes.
Q. Okay. So, a newer battery could have a lower compliance percentage. But because the limit is
lower, it's actually impacting the ambient air less?
A. Could you ask that again? I'm not sure I'm
getting it. Ask it again please.
Q. Okay. A newer battery could have a lower compliance percentage, but actually have less impact to the ambient air because its compliance percentage
-- or because its limits are more stringent?
A. I'm not sure. I would have to do the math. Compliance percentage -- you said if it has a lower compliance limit, it would be -- I'm not sure I'm getting where you want me to go.
Q. Okay. Because the corrective action is based on compliance percentages and not overall impact to the ambient air, it's possible that U.S. Steel could emit less overall emissions, and still be required to hot idle?
A. Well, they have to show improvement overall, so there would be improvement. But you're saying improvement means more in one battery than another battery? Possibly, but overall, there needs to be improvement to the operations.
Q. Right. So, there's a potential scenario here where you see improvement with compliance percentages, but the impact to the ambient air is actually more pollution?
A. I don't see how you would go there. No, I wouldn't think so.
Q. You're telling me that that's impossible?
A. I'm not sure how you're getting to that conclusion, so I would say no.
Q. The penalty if U.S. Steel doesn't meet the baseline compliance for two successive quarters is to hot idle two batteries, correct?
A. Yes.
Q. That's a severe penalty?
A. It is. It is a severe penalty, yes.
Q. It's a significant penalty?
A. Mmhmm (affirmative).
Q. You have to say yes or no. You said, "Mmhmm."
A. I said yes. It is a significant penalty.
Q. And it's severe?
A. Well, they've idled before, so it's -- it's a significant penalty.
Q. Would you disagree with it being a severe penalty?
A. That's a judgment call, I would say. I'm not sure that \(I\) would call it severe. It's significant though.
Q. Did you call it severe when you were deposed

\section*{a few weeks ago?}
A. I have no idea what I said two weeks ago when I was deposed.
Q. Is it possible that you did?
A. It's possible that \(I\) said anything.
Q. Is it possible that you said, "Do you believe that that was a severe sanction? Yes"?
A. If it's in there, then I said it, yes.
Q. The B Battery Door Leak Standard -- the intent of that standard was to regulate HAPs, Hazardous Air Pollutants, correct?
A. HAPs and H2S, yes. It was the gaseous amissions.
Q. And that's because the B Battery has the coke side shed for PM 2.5 controls, correct?
A. That, and the fact that that was -- we were seeing a lot more doors leaking there.
Q. And the shed that the coke side of Battery \(B\) has, is one of the best emissions controls that exists for capturing PM 2.5, correct?
A. It ie one of the better ones, yes.
Q. When you -- when the Enforcement Order was issued, what was your position?
A. I was the Head of the Air Quality Program. I'm not sure what the question is.
Q. You were the Head of the Air Quality Program in June when the Enforcement Order was issued?
A. When the Enforcement Order -- when the 2016

\section*{Order was issued?}
Q. The order that's on appeal?
A. Yes.
Q. You were the head of the Air Quality?
A. I was the Head of the Air quality Program, yeah.
Q. Okay. Is it fair to say that you reviewed it and approved it before it was sent to U.S. Steel?
A. I did review it. I was not the final approval, but I did review it.
Q. When you reviewed it and approved it, you didn't know how the Door Leak Standard was derived; is that fair?
A. I'm pausing because I'm trying to remember how the discussions went. I mean, I did not derive them.
Q. And you didn't know how the standard was derived when you approved it?
A. I would say probably not, but I did look at the actual scan.
Q. You didn't know what data was used to derive the standard before you approved it?
A. Well, we had looked at some data that showed
that -- we are looking at compliance data and used compliance data to show, but I can't -- I can't recall what we were using.
Q. When you approved the Enforcement Order, you didn't know if anything was done to figure out whether U.S. Steel could feasibly meet that standard?
A. We looked at compliance data to see if they could meet it, yes.
Q. So, you're saying that you looked at that before approving it?
A. I'd say we, as a group, looked at it.
Q. Did you? Did you look at it and approve it?
A. I'm trying to look and trying to remember -I'm confusing which data was which, but, yeah. I would have looked at it. I would not have specifically approved any point of data, but I would have look at the data.
Q. When you approved the Enforcement Order, you didn't know if there was any technological -- or any analysis that was technologically feasible?
A. Once again, I did not approve it, but I did review it, and I felt that it was technologically feasible.
Q. You felt it was when you approved it?
A. When I reviewed it.
Q. Do you remember just a few weeks ago, you had your deposition taken in my office, right?
A. Yes.
Q. And you were under oath?
A. Yes.
Q. Can you look at your deposition, it's Tab Two, on Page 125? This was only a few weeks ago, right?
A. Yes.
Q. All right. I want to start on Line Three on 125. My question to you was, "Do you know how the 10 door leak per month standard compares to the Federal NESHAP Standard?"

Your answer, "No."
"Do you know how it compares to any existing SIP
Standard?"
Your answer, "No."
"Do you know how it compares to any existing
State Standard for door leaks?"
Your answer was, "No."
"Do you know if this 10 door leak per month
standard was generated based on any risk assessment?"
"I don't believe so."
"Do you know if this standard of 10 door leaks
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per month was based on any analysis of technological
feasibility?"
"That, I don't know."
"Do you know if there was any empirical analysis
done to create the 10 door leak per month B Battery
Door Standard in the enforcement?"
"That I don't know."
Can you look back on page -- was that all
correct?
A. I believe so, yes.
Q. Would you look back on Page 118? Do you see
Line 11?
A. Yes.
Q. My question to you, "Was it the Department's
intent that if U.S. Steel does not meet this B Battery
Door Standard, that that would trigger the
requirements to hot idle two batteries?"
Your answer, "That is the intent."
Question, "Why?"
"As with the other ones, it's an indication of
improvement or not improvement."
Question, "How was this standard derived?"
Your answer, "I don't know that I can say. I
don't know."
Did I read that correctly?

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A. Yes.
Q. You do know that there was no risk assessment done before the B Battery Door Leak Standard was derived?
A. No risk assessment. We are decreasing toxic emissions.
Q. So, you're saying there was a risk assessment done?
A. There was not a risk assessment. There is a knowledge that will -- the intent is to decrease toxic emissions, and this would decrease toxic emissions.
Q. You know that there was no analysis done to estimate the effect on ambient air as a result of this new B Battery Door Leak Standard, correct?
A. There was no ambient analysis done.
Q. And no ambient analysis would include no analysis of hazardous air pollutants, correct?
A. Correct.
Q. Okay. The Department didn't model any emissions from decreasing door leaks at B Battery; is that correct?

\section*{A. As far as \(I\) know.}
Q. I want to switch gears and talk about the 2016 Consent Judgment. You were involved in that, correct?
A. I was involved, yes.
Q. You were involved in the negotiations that
led to the 2016 Consent Judgment?
A. I was part of the group, yes.
Q. And the 2016 Consent Judgment was entered by the Allegheny County Court of Common Pleas, correct?
A. Yes.
Q. It was an agreement between the County and U.S. Steel, correct?
A. Correct.
Q. And it was presented to Judge ward, who is a Judge in the Allegheny County Court of Common Pleas?
A. That is correct.
Q. And it was entered as an official order, correct?
A. Yes.
Q. If you look at Exhibit One, the 2016 Consent Judgment is actually listed as Exhibit B to Exhibit One, so it's about a little more than halfway through the documents. And just for the record, I'm talking about the U.S. Steel One. Are you at the Consent Judgment?
A. I am.
Q. And there's 24 pages of this Consent Judgment; is that correct?
A. I will agree. I do not have the numbers on this.
Q. And if you look at the next page --
A. If we're not including appendices, yes.
Q. And it says, "One of 24, " at the bottom, just for the record, correct?
A. Yes.
Q. And this is the Consent Judgment, correct?
A. Yes.
Q. And this was the one that you were involved in?
A. I believe so, yes.
Q. I want to look at Paragraph 26, please.
A. Okay.
Q. And just so we're clear, this was a document that was negotiated and agreed to between the County and U. S. Steel, correct?
A. It was.
Q. Okay. Paragraph 26 says, "The parties have agreed that the most effective surrogate for environmental performance across the entire facility is plume opacity from the battery combustion stacks." Did I read that correctly?
A. Yes.
Q. And plume opacity from the battery combustion
stacks is measured by the COMS that we have talked about in this case, correct?
A. Yes.
Q. And that's referring to the battery stacks, which are the large chimney looking structures?
A. It does, yes.
Q. And there are no alleged violations in this Enforcement Order that's the subject to the appeal related to battery stacks, correct?
A. I don't believe so, no.
Q. And we can agree that stack emissions is the most significant surrogate for environmental performance site wide, correct?
A. I would agree to that. I would like to talk a little about what surrogate means. I mean, you're talking about a substitute. This goes back to when I was talking about emission factors. It's just something to represent --
Q. Just so we're clear, did you say you would agree or you wouldn't agree to that?
A. I would to that as part of this, yes. I mean, that was a statement, and we did agree to it, but as a surrogate. So, it's only representative of what's happening in -- you know, plant wide. If you're looking at one thing for the health of a
battery, this was the surrogate for the health of that battery. It doesn't really cover the operation of that battery.
Q. And it's a good representation of the condition and performance of the hundreds of coke ovens that are at Clairton?
A. Of the health of a battery itself, not the operations around it, the operations of the doors, the operations of the lids, the operations of the charging. It's a -- it is a fair representation and a good representation of the health of that battery, yes.
Q. Using the most significant surrogate for environmental performance site wide, what was U.S. Steel's compliance percentage at the beginning of 2018?
A. I do not know.
Q. Does 99.3 percent-plus ring a bell?
A. That sounds familiar. I don't know the exact number, but I will accept that.
Q. And the County calculated it, correct?
A. Yes.
Q. And you recall it being above 99 percent?
A. I recall it being very good, yes.
Q. So, you recall that the most significant
surrogate for environmental performance site wide was very good in the penalty period that we're talking about for the Enforcement Order?
A. For the health of the battery, yes.
Q. And the 2016 Consent Judgment had a target of 98.5 percent battery stacks, correct?
A. Yes.
Q. And obviously, 99 percent compliant is better than 98.5 percent, correct?
A. Yes.
Q. The baseline that U.S. Steel has to exceed
includes battery stack compliance, correct?
A. It does.
Q. And that baseline is not 98.5 percent, which was the compliance target agreed to in the 2016 Consent Judgment, right?
A. Could you ask that again?
Q. Yeah. The COMS compliance percentage that goes into the baseline, that number is above 99 percent, correct?
A. Yes.
Q. It's not the 98.5 percent that was agreed to in the Consent Judgment?
A. Yes.
Q. Is U.S. Steel's performance, as a result of
the Consent Judgment actually making it harder now on this baseline?
A. No, I don't think so. But what it does consider, and this is part of what we're doing is, is making sure that the stacks don't deteriorate while all of the work is being done on the outside of the battery. So, often when we put together Enforcement Orders, the work is dedicated -- like the 2016 action, a great deal of work is done for the through walls and improvement of the stacks and then everything else is let go.

And so, the intent was -- of this action was to say that we're going to encompass the entire battery, so we're going to include the health and the quality of the combustion stack, along with all of the fugitive emissions. We don't want -- if we just listed the fugitive emissions, then we'll watch stacks deteriorate. If we only do pushing, we are going to watch -- you know, see lids deteriorate.

So, we're saying we want compliance of the entire battery. And so, that's why this Enforcement Order included the entire battery.
Q. And we could agree that 99.3 percent compliance on COMS is significantly better than 98.5 percent, right?
A. Right. And as long as they keep it at that level, and then bring up all of these fugitives and improve those, then they will comply with the requiremente, or you will have complied with your requirements. What we don't want to see is the stacks deteriorate while the other ones are improving.
Q. In the 2016 Consent Judgment, when you established the 98.5 percent compliance, there's not much room to go above that, correct?
A. Correct.
Q. But we got above it. We got above 99
percent, correct?
A. It was very good, yes.
Q. And now that's the number that moves into the baseline that can trigger hot idle?
A. Yes. As long as you keep that number while all of the other things are improving, then you will not go into hot idle.

MR. DAUSCH: That's all I have. HEARING OFFICER SLATER: Any redirect, Mr. Willis? MR. WILLIS: Yes, just a little. REDIRECT EXAMINATION
BY MR. WILLIS:
Q. Ms. Graham, has H 2 S been an issue with
respect to this appeal? Let me rephrase that.
A. Yes, please.
Q. Did we issue a penalty with respect to H2S?
A. We do not issue violations in regard H2S, but H2S is a continuing problem. The odor limit is very -- the odor perception is very small, and we've exceeded that many, many times.
Q. Well, I'm talking specifically with respect to the Enforcement Order that's on appeal. Is there any provision in there that addresses H2S specifically?
A. Not directly to H2S. Not directly the pollutants. It the visual emissions.
Q. Okay. Would you agree that door leaks is a primary or a principle issue that's of concern with respect to the batteries?

\section*{A. Yes.}
Q. And when there's a door leak, would you also agree that one of the emissions is coke oven gas?
A. That is the primary issue, yes.
Q. Would that be raw or clean coke oven gas?
A. That would be raw coke oven gas.
Q. And could we also agree that when there are more leaks, that there's going to be a correlating emission of coke oven gas?
A. Yes. Yes, it would be.
Q. Would you need a study to figure that out?
A. No. I mean, raw coke oven gas contains such a wide range of chemicals. We know that anytime there's a door leak, you're going to have that wide range of chemicals.
Q. Okay. And -- one second. With respect to emission limits, is there a way to test for leaks, door leaks?
A. There's really not a practical one. We've discussed with the company at times to see if there is a way, but there really isn't. Visible emissions is really our best -- again, to use the word surrogate. We look at visible emissions. If there's more -- if there's more smoke coming out, we take that to mean there's more tar, there is more light oils, there's more benzene, toluene, and xylene. You know, this is all -- but to actually measure it, there's not a practical means to do so.
Q. Is that why there's no emission limits with respect to those?
A. Yes. I mean, if we could measure it, then we would have and then we would have better emission factors and our emission inventory would probably include that more in those areas.
Q. So, the emission inventory does not include that sort of data?
A. It has very simplistic surrogates. It really does not have any accurate data for emissions coming from door leaks.
Q. Okay. And with respect to the SIP, does the SIP presume or take into consideration violations?
A. No. The SIP is -- we -- what we are required to demonstrate is if all of the sources in the immediate area operate at their full operation at their allowable -- their highest allowable limit -that does not take into consideration -- we're actually not allowed to take in consideration violations -- or exceedances -- yeah, violations or noncompliance. This is a compliance plan, so it has to -- it assumes compliance.
Q. So, let me understand. If there is an SO 2 SIP, which has been approved by the EPA -- we've already submitted one, and we've indicated that. It's proposed as of right now. We've submitted a proposal to the EPA, and it's under review. If that is approved, it will not take into consideration violations that we are concerned about at this point in time?
A. No. It assumes total compliance with the
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regulations that are in our --
Q. Is it possible that for even -- for even a
moment in time that Allegheny County can come into
compliance or reach attainment with respect to the
limits for SO2 and PM 2.5? Is that --

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    A. I believe -- yes. That's the plan. I'm not
sure I understand the question.
Q. No, that's what I asked.
A. The plan is to demonstrate that if the source stays within the emission limits that are within the permit or in the SIP or the regulations in the books, that we would be in compliance.
Q. And with respect to attainment, is it a situation of once in, always in; so once we get it, we're locked into attainment?
A. No, we can fall out of attainment with -- if the air quality stays poorly. And there's actually a five-step process to become attain- -- to be designated attainment. One of those -- one of those is measuring air quality, but there's a number of steps to get into attainment. But we can fall out of attainment by simply having -- continuing to have violations of the standard at the monitors.
Q. Notwithstand the proposed SIP, which we all believe will be adopted by the EPA, there's a
potential for backsliding and a potential to fall back out of attainment?
A. Certainly, or not even reach attainment because attainment has to be designated.
Q. And what sort of -- this might be too broad of a question, but I'm trying to understand what data set -- like, what time frame's worth of data would be of concern for the attainment? Would it be one year's worth of data, two years, three years, five?
A. The attainment demonstration is measured on three years' worth of data.
Q. Okay. And so, even one year of increasing violations could knock us out of attainment ..
A. Certainly.
Q. -- and prevent us from reaching attainment?
A. Certainly.
Q. Is that a concern with respect to this

Enforcement Order?
A. Yes. We need to start the measure of attainment immediately. The clock has started.
Q. The clock has started?
A. Yes.
Q. When did the clock start?
A. Well, the controls that we put in the plan went into to place in the beginning of October, and so
we need to be demonstrating -- first, we need to demonstrate one year's worth of attainment; the next year, two years; and then three years. The third year will be our final demonstration, with all of our other documents to say we can -- we will be -- we can -- the EPA can say that we're measuring attainment, but we will not be designated attainment until we meet the other items, but we'll need the three years to improve air quality.
Q. And with the remedies that we have in place within the Enforcement Order, will this help maintain?
A. I think it would, yes. For both the SO2 and the particulates, yes.
Q. For both of them?
A. Yes.
Q. Is a shutdown more severe than hot idle?
A. Certainly. A shutdown of a battery is
essentially destroying the battery. If it goes to a cold -- from what I understand, the bricks cannot withstand going cold. So, if they go cold, you pretty much have to rebuild your battery from scratch.

Hot idle -- as U.S. Steel has demonstrated in the past when they went to hot idle, a source can go to hot idle for a period of time and then bring the unit -- carefully, they can bring it back into operation.

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Q. So, we have information available to us that would demonstrate that it's possible to recover from not idle?
A. It happened in 2009.
Q. And as you've already read from 2109, the Enforcement Section, what we have done is not a shutdown in part or in whole of the facility?
A. No, it is not.
Q. We have not, in fact, even ordered a hot idle?
A. No. It's a condition.
Q. It's a condition. It's a condition that occurs upon failure of their own activity to correct the -- their exceedances?
A. Yes.
Q. You mentioned earlier that you thought that there -- there has been improvement in the air quality over the past 10 years. Would you agree with that statement?
A. Yes. There's been improvement over the past 20 years. There continues to be a general improvement. Although, in the last few years there has been an upturn, and we've had some deterioration.
Q. So, there's basically been a little bit of a backslide with respect to the air quality in at least
the last two years?
A. Yeah. I would have to look at the air quality data to see how far back it went, but it is -there's been -- there was a -- you can have one year that goes out because of meteorology and such. And I think, as it was demonstrated during the earlier testimony, that 2017 did show some uptick. But the Liberty Monitor has been going up for several -- for several years now --
Q. Okay.
A. -- for particulates.
Q. With respect to the COMS, is that the only way to measure the performance of a battery?
A. No. We do viaible emissions. We do inspections.
Q. Do we do stack tests?
A. There are stack tests.
Q. And so, that's a measure of how the battery is performing?
A. Correct.
Q. With respect to the visible emission inspections, would that be a surrogate for the operation and maintenance of a facility to determine the performance of the operation of a facility?
A. I think most certainly, yes.
Q. I'm going to direct you to the permit, the Title Five Permit for U.S. Steel. It's tabbed under Section 30. If you would go to -- go to Page 59 just as an example of what's in this document. If you look at Number Six, what section is that?
A. It's called, "Work Practice Standards."
Q. And Letter \(A\), could you read that for me?
A. I think this is a section for Batteries 1, 2,
and 3 because it says -- A says, "Coke oven Batteries 1, 2, and 3 shall be properly maintained and operated at all times according to good engineering and air pollution control practices."
Q. Okay.
A. I believe there is a similar section in all of the batteries.
Q. That's what I was going to ask you, if there was a -- because if you look to Page 77, it looks as though there's a similar provision for Number Six on Page 77. Do you see that? In this case, it would be B.
A. Yes. Six B says, "As required by Section 63," which is the Federal Requirements, "63.6 E1I, the permittee shall operate and maintain each coke -- coke battery, including air pollution controls and monitoring equipment in a manner consistent with good
air pollution control practices for minimizing emiasions at least to the levels required by," and then there's a Federal quote.
Q. Okay. If the source, in this case U.S. Steel, fails to maintain and operate at all times according to good engineering and air pollution control practices, would that be a violation of this permit?
A. It would be.
Q. Would it be a violation of Article 21 ?
A. It would be, since Article 21 references the Federal Standards.
Q. And does Article 21 have an operation and maintenance provision as well?
A. It does.
Q. Okay. So, there would be an expressed provision of Article 21 with respect to its operation that would be violated?
A. Yes.
Q. Does the SIP, to your understanding, make use
of the emissions inventory that we discussed earlier?
A. It uses several emissions inventories.
Q. Several?
A. Yes.
Q. Could you describe the emissions -- the,
plural, emissions inventories that are used by the SIP?
A. Well, the -- there is an inventory that's called the Base Year Inventory, and that's used to validate or assure that the model is the appropriate model, and it uses actual emissions, or the best estimate of actual emissions. As I said before, it's very hard to estimate emission for things like battery fugitives or things like that. We're using what we can use. We use it, and we try to validate the model itself.

The compliance run -- the compliance inventory, is everything operating in compliance, but at its maximum allowable. So, those are the two emission inventories.
Q. Because of that -- that -- that sort of ambiguity with respect to quantifying the fugitive emissions and making use of that in the emissions inventory, what's the concessions that are made, if any, for quantifying those emissions in the emissions inventory? Say, for example, SO2 from a door leak, is it --
A. Well, in that case, we don't have numbers, so we don't include it. If we had some numbers, we would include it. So, unfortunately, we can't -- you know,
we don't put something in. But if we really think that the emission factor is very poor or it's non-existent -- there are sulfur dioxide emissions coming -- well, actually it's H2S becoming sulfur dioxide almost immediately, but we don't have values for that.

So, we work with what we have, and we try to do the best analysis we have. That would not be included in the SIP because we would not have anything that we could justify or verify.
Q. And what you have are generally other surrogates, which would assist in understanding the emission profile with respect to SO2?
A. As best we can, yeah. Where we have measured data, we use measured data. Where we have surrogates, we have surrogates. So, we do -- we do the best we can.
Q. Are visible emission readings or inspections surrogates?
A. Yes.
Q. What are they surrogates for?
A. Well, they can be a surrogate for -- they're surrogates for all of the emissions that we wouldn't normally measure. Depending on the source, if it's if it's -- it could be -- it's definitely
particulates. It could be sulfur dioxide, it could be hydrogen sulfide, it can be BTEX, and all of the chemicals that we're seeing.

If it's something like a battery fugitive -- and we know what a battery fugitive is. It's coke oven gas, raw coke oven gas, and we know what that contains. We know from books what that contains. So, the -- the visible emissions is a surrogate for all of those chemicals.

MR. WILLIS: Okay. I have no further
questions.
HEARING OFFICER SLATER: All right.
Mr. Dausch, do you have some recross?
MR. DAUSCH: I do.
HEARING OFFICER SLATER: Okay.

\section*{RECROSS-EXAMTNATION}

BY MR. DAUSCH:
Q. The SO2 SIP that you had mentioned, it includes emissions estimates?
A. Mmhmm (affirmative).
Q. Say yes or no.
A. Yes.
Q. And you said that the emissions estimates are a model assuming compliance, correct?
A. Correct.
Q. That compliance is assuming compliance with
the Federal NESHAP Standard, correct?
A. As well as with the county limits, yes. We don't really model for the NESHAPs, but because NESHAPs are air toxics emission limits, we are -we're going against Article 21 sulfur dioxide limits,
Q. So, your testimony is that the NESHAP compliance is not what's used for the model?
A. No, it would not be, not for a sulfur dioxide model.
Q. The coke oven gas that you mentioned earlier is a hazardous air pollutant, correct?
A. Yes.
Q. And there are National Emissions Standards for hazardous air pollutants like coke even gas?
A. Yes.
Q. And the County enforces these standards?
A. Yes.
Q. There's a standard for door leaks?
A. Yes.
Q. There are inspectors at every battery every day inspecting for these standards on door leaks, correct?
A. I'm not sure if they're there every day, but they are very frequent, yes.

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Q. And U.S. Steel is 100 percent compliant with those standards?
A. Yes.

MR. DAUSCH: That's all I have.
HEARING OFFICER SLATER: Any --
MR. WILLIS: Just one clarifying question. HEARING OFFICER SLATER: Yeah.

\section*{BEDIRECT EXAMINATION}

BY MR. WILLIS:
Q. You just mentioned U.S. Steel is compliant with all of those standards. What standards
specifically are you referring to?
A. The Federal -- the NESHAP Standards. And I don't know specifically what they are, but the NESHAP standards allow for, like, 30-day rolling averages and some of those are above average. So, the Karamida -we refer to them as the Karamida Inspectors. They inspect against the -- those Federal Regulations.
Q. Okay.
A. They do not enforce against our regulations.
Q. That's kind of where I was going. You weren't specifically referring to Article 21 violations?
A. No, I was specific with those. Those are hazardous air pollutant standards, and they're Federal
Standarde. The SO2 plan is against the Article 21
Regulations.
    MR. WILLIS: Okay. Thank you.
    HEARING OFFICER SLATER: Mr. Dausch, any
further questions?
    MR. DAUSCH: Nothing further, Mr. Slater.
And if we're going to conclude for today, --
    HEARING OFFICER SLATER: Yeah.
    MR. DAUSCH: -- maybe we can hang out and
talk about our plan for tomorrow off the record, if
that make sense.
HEARING OFFICER SLATER: Yeah, we can do
that.
    MR. DAUSCH: All right.
    HEARING OFFICER SLATER: Let's go off the
record.
    (The hearing recessed at 4:07 p.m.)
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            CERTHETCATE OF REPORTER
COMMONWEALTH OE PENNSYLVANIA :
COUNTY OE ALLEGHENY :
    I, Aimee E. Davis, a Notary Public duly
commissioned and qualified in and for the said
commonwealth and County, do hereby certify that
pursuant to the notice, the within named persons were
sworn by me to testify to the truth and nothing but
the truth; that the testimony was reduced to writing
the truth; that the testimony was reduced is is a true
under my supervision; that this transcript is a
record of the testimony given by the witnesses.
record of the testimony given by the witnesses.
I further certify that I am neither attorney nor
    I further certify that I am neither attorney nor
counsel for, nor related to or employed by any of the
counsel for, nor related to or employed by any of the
parties to the action in which this hearing was taken;
and further, that I am not a relative or employee of
any attorney or counsel employed by the parties or
financially interested in this action.
    In testimony whereof, I have hereunto subscribed
my hand and affixed my seal of office this Saturday,
December 22, 2018
My Commission Espires:
                    Mande Clocer
                Notary Public
air
\begin{tabular}{|c|c|c|c|}
\hline - & \[
\begin{aligned}
& (48: 23)(49: 2)(49: 14) \\
& (62: 21)(128: 1)
\end{aligned}
\] & addresses \(\quad(270: 10)\)
adelman \((1: 23)\) & \[
\begin{aligned}
& (102: 19)(104: 19) \\
& (104: 22)(121: 8)
\end{aligned}
\] \\
\hline 5:1) (56:12) & acknowledged (229:9) & adhere (67:16) & (146:14) (146:17) \\
\hline :16) & acrose (21:4)(25:13) & (67:18) (188:5) & \((146: 21)(148: 24)\) \\
\hline & \((33: 8)(52: 6)(80: 19)\) & adjusted & \\
\hline A & (102:22) (102:25) & administrati & (156:21) (190:15) \\
\hline aberrations (223:19) & (172:18) (264:21) & admission (90:10 & (208:20) (212:5 \\
\hline (224:12) & act (9:12)(15:6) & (172:24) (217:25) & (212:20) (217:19) \\
\hline abide (190:23) & \((16: 12)(16: 15)(16: 16)\) & (229:16) & (243:4) (245:8) \\
\hline ability (35:8) & \((16: 23)(17: 22)(18: 6)\) & admit (172:23) & (246:21) (247:1) \\
\hline (165:11) (180:21) & \((18: 16)(19: 4)(19: 13)\) & admitted (4:2) & (248:2) (249:5) \\
\hline able (31:20) (35:2) & \((19: 15)(22: 13)(22: 16)\) & (13:19) (13:23) (90:17) & (253:25) (264:1) \\
\hline \((47: 3)(129: 2)(179: 16)\) & \((22: 17)(23: 10)(24: 13)\) & (91:7) (172:6) (210:13) & (265:11) (265:14) \\
\hline (181:22) (181:23) & \((25: 4)(26: 7)(28: 10)\) & (214:1) (218:3) (228:7) & (265:20) (265:22) \\
\hline above ( \(42: 8)(47: 20)\) & action (9:11)(93:1) & (229:21) (234:11) & \((268: 23)(270: 14)\) \\
\hline (72:12) (102:2) (102:7) & (93:3) (98:17) (99:9) & adopted (27:25) & (270:19) (270:23) \\
\hline (102:15) (102:19) & (159:2) (205:8) & (273:25) & (276:18) \\
\hline \((103: 1)(103: 4)(103: 7)\) & \((205: 21)(248: 3)\) & adopting (27:25) & agreed (190:23) \\
\hline \((104: 17)(104: 19)\) & (255:12) (268:8) & advance (216:20) & (264:16) (264:20) \\
\hline \((104: 20)(108: 20)\) & (268:12) (286:11) & advanced (99:8) & (267:15) (267:22) \\
\hline (158:1) (203:4) & (286:12) & (99:13) (104:2) & agreement (4:3) \\
\hline (266:23) (267:19) & actions (8:1)(48:4) & advice (112:5) & (70:9) (157:5) \\
\hline (269:9) (269:11) & \((95: 23)(187: 2)(211: 5)\) & (112:9) (112:11) & (247:11) (248:7) \\
\hline (284:16) & (211:9) (215:25) & (112:13) (112:16) & (248:12) (263:8) \\
\hline absence (37:13) & (239:15) (239:19) & \((112: 20)(113: 9)\) & agreements (9:6) \\
\hline \((37: 20)(42: 7)\) & activity (27:19) & (113:11) (114:15) & ahead (78:11) \\
\hline absolute (115:5) & (80:8) (80:10) (152:17) & advise (113:10) & aimee (286:6) \\
\hline absolutely (49:3) & \((175: 12)(175: 16)\) & advisory (127:5) & \[
\operatorname{air}(1: 8)(6: 12)
\] \\
\hline (51:3) (53:4) (55:18) & (276:13) & (180:9) (180:11) & \((6: 15)(6: 18)(7: 4\) \\
\hline (139:5) (140:13) & acts (16:9) & (242:18) (242:25) & \((7: 25)(8: 20)(8: 25)\) \\
\hline (148:16) (247:20) & actual (31:17) & affect (160:6) & \((9: 5)(9: 14)(12: 4)\) \\
\hline (247:25) & (38:12) (141:23) & affected (202:6) & \((13: 3)(14: 18)(15: 6)\) \\
\hline absorbed (192:22) & \((142: 2)(179: 12)\) & (229:14) & (15:9) (16:3) (16: \\
\hline abuse (8:8) & \((186: 14)(201: 5)\) & affecting (243:24) & \((16: 10)(16: 11)(16: 12)\) \\
\hline accelerator (48:12) & (213:2) (258:23) & affects (18:18) & \((16: 15)(16: 16)(16: 23)\) \\
\hline accept (266:20) & (280:6) (280:7) & (161:12) & \((17: 22)(18: 5)(18: 16)\) \\
\hline accomplish (188:1) & actually (6:1)(7:16) & affirmative (105:17) & \[
(19: 2)(19: 4)(19: 7)
\] \\
\hline accomplished & \((16: 15)(20: 15)(22: 12)\) & (256:13) (282:20) & \[
\begin{aligned}
& (19: 12)(19: 13)(19: 15) \\
& (19: 16)(19: 22)(21: 15)
\end{aligned}
\] \\
\hline according (133:5) & \((22: 20)(23: 3)(36: 8)\) & \begin{tabular}{l}
affixed (286:13) \\
after (12:7)(13:10)
\end{tabular} & \[
\begin{aligned}
& (19: 16)(19: 22)(21: 15) \\
& (22: 13)(22: 15)(22: 17)
\end{aligned}
\] \\
\hline \((148: 10)(204: 10)\) & \((38: 10)(40: 6)(40: 13)\)
\((43: 12)(45: 15)(45: 16)\) & after (12:7)(13:10)
\[
(15: 15)(15: 16)(15: 19)
\] & \[
\begin{aligned}
& (22: 13)(22: 15)(22: 17) \\
& (22: 18)(23: 8)(23: 10)
\end{aligned}
\] \\
\hline \((208: 22)(278: 11)\)
\((279: 6)\) & \((43: 12)(45: 15)(45: 16\)
\((46: 6)(49: 22)(66: 17)\) & \((15: 24)(38: 8)(41: 21)\) & \((24: 13)(25: 3)(25: 4)\) \\
\hline account (178:7) & \((81: 14)(90: 8)(90: 19)\) & \((77: 6)(104: 6)(110: 23)\) & \((25: 7)(25: 9)(26: 7)\) \\
\hline (178:12) (178:22) & \((96: 6)(113: 1)(113: 17)\) & (113:3) (114:17) & \((26: 25)(27: 13)(28: 10)\) \\
\hline accumulate (213:3) & \((135: 17)(137: 18)\) & (114:23) (115:19) & \((34: 14)(40: 7)(40: 11)\) \\
\hline accuracy (138:1) & (153:19) (162:5) & \((116: 6)(117: 2)\) & \((42: 2)(42: 16)(43: 5)\) \\
\hline accurate (96:24) & \((166: 17)(175: 5)\) & (117:15) (162:25) & \((44: 22)(47: 6)(71: 8)\) \\
\hline \((149: 3)(177: 15)\) & \((176: 16)(177: 5)\) & (167:11) (174:5) & \((71: 10)(71: 16)(97: 17)\) \\
\hline \((177: 16)(235: 15)\) & \((177: 12)(184: 9)\) & \((174: 16)(180: 17)\) & \((97: 20)(126: 15)\) \\
\hline (241:4) (246:4) (272:4) & (190:22) (191:5) & (180:18) (189:8) & (126:17) (126:18) \\
\hline achd (4:8)(52:19) & \((193: 25)(197: 23)\) & \((196: 6)(220: 16)(230: 4)\) & (134:17) (141:8) \\
\hline \((63: 16)(63: 23)(84: 14)\) & (200:22) (229:25) & afternoon (234:17) & (142:25) (149:2) \\
\hline \((84: 19)(85: 16)(90: 10)\) & (255:1) (255:5) & against (76:24) & \((149: 10)(153: 9)\) \\
\hline \((90: 12)(90: 16)\) & (255:24)(263:18) & (86:7) (182:16) & (153:13) (154:15) \\
\hline \((119: 16)(124: 17)\) & (268:1) (271:18) & (183:25) (184:10) & (154:19) (159:8) \\
\hline \((133: 1)(158: 13)\) & (272:13) (273:17) & (186:1) (186:2) & (161:12) (174:25) \\
\hline \((164: 24)(165: 10)\) & (281:4) & (191:21) (191:24) & (175:7) (176:19) \\
\hline \((187: 7)(195: 4)(195: 6)\) & acute (223:4) & (205:11) (214:19) & \[
(180: 8)(192: 20)
\] \\
\hline \((210: 8)(210: 12)\) & adamant (172:19) & (250:21) (252:9) & \[
\begin{aligned}
& (208: 7)(220: 3)(227: 8) \\
& (227: 9)(227: 15)
\end{aligned}
\] \\
\hline \((210: 15)(213: 18)\) & add (28:23)(150:16) & \[
(283: 6)(284: 18)
\] & (227:9) (227:15) \\
\hline \((213: 25)(215: 15)\) & adding (231:8) & (284:20) (285:1) & \[
(242: 25)(245: 8)
\] \\
\hline \((215: 17)(217: 21)\) & addition (7:17) & age (151:22) & \[
(245: 9)(245: 14)
\] \\
\hline (217:25) (218:2) & (55:11)(243:11) & agencies (17:16) & (246:2) (249:2) (249:9)
\[
(249: 12)(249: 15)
\] \\
\hline (219:8) (227:25) & additional (78:17) & \[
(17: 18)(22: 19)(22: 20)
\] & \[
\begin{aligned}
& (249: 12)(249: 15) \\
& (250: 22)(250: 24)
\end{aligned}
\] \\
\hline \((228: 6)(228: 9)\)
\((229: 17)(229: 20)\) & \[
\begin{aligned}
& (79: 2)(196: 11)(204: 2) \\
& (204: 5)(208: 3)(208: 16)
\end{aligned}
\] & \begin{tabular}{l}
agency (18:11)(22:11) \\
aggressive (248:10)
\end{tabular} & \[
(251: 1)(251: 2)(251: 5)
\] \\
\hline \((229: 17)(229: 20)\)
\((229: 23)(234: 11)\) & \((204: 5)(208: 3)(208: 16)\)
address \(\quad(7: 21)(12: 3)\) & \[
\begin{aligned}
& \text { aggressive (248:10) } \\
& \text { ago }(6: 2)(244: 3)
\end{aligned}
\] & \[
(254: 2)(254: 7)(255: 1)
\] \\
\hline achd's (219:16) & \((46: 22)(46: 23)(47: 5)\) & \((257: 1)(257: 2)(260: 2)\) & (255:6) (255:14) \\
\hline achievable (241:21) & (55:9) (207:21) & (260:8) & (255:24) (257:11) \\
\hline (241:24) & (227:12) (249:9) & agree (57:3) (60:14) & \[
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\] \\
\hline achieved (15;17) & addressed (55:4) & (61:11) (70:13) (70:20) & \\
\hline
\end{tabular}

\section*{airtight}
attachment
\begin{tabular}{|c|c|c|c|}
\hline (262:13) (262:17) & (259:21)(261:1) & \((27: 24)(66: 24)(196: 8)\) & (188:6) (189:22) \\
\hline \((273: 17)(273: 20)\) & \((261: 4)(262: 12)\) & \((243: 1)(243: 2)(258: 13)\) & (201:14) (207:1 \\
\hline (275:9) (276:17) & (262:15) (262:16) & approve (54:23) & \[
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\] \\
\hline (276:25) (277:2) & (262:17) (281:8) & (259:13) (259:22) & (208:8) (208:11) \\
\hline \((278: 11)(278: 24)\) & anecdote (5:24) & approved (23:23) & (208:17) (235:9) \\
\hline \((279: 1)(279: 6)(283: 5)\) & (203:5) & (23:25) (24:8) (53:6) & (235:14) (235:17) \\
\hline \((283: 12)(283: 15)\) & a-n-e-u-p-1-i-d & \((180: 15)(187: 16)\) & (250:16) (251 \\
\hline (284:25) & animals (223:19) & (258:11) (258:14) & (279:10) (279:11) \\
\hline airtight (46:4) & (224:12) & (258:21) (258:25) & (279:13) (279:17) \\
\hline aligned (73:2) & annual (17:7)(71:8) & (259:5) (259:17) & (283:6) (284:22) (285: \\
\hline aliments (44:8) & \((76: 24)(76: 25)(83: 2)\) & (259:19) (259:25) & articles \\
\hline allegation (215:23) & (141:9) & (272:18) (272:22) & asbestos (175:13 \\
\hline alleged (146:17) & answer (21:8) & approves (23:21) & (175:15) (184:20) \\
\hline (211:5) (237:18) & \((116: 14)(129: 19)\) & (67:10) & (184:22) (185:4) \\
\hline (239:15) (252:9) & \((165: 4)(245: 4)\) & approving (67:3) & (185:5) (185:6) (1 \\
\hline \((252: 14)(254: 1)(265: 7)\) & (260:15) (260:18) & (259:11) & (185:10) (18 \\
\hline allegheny (1:2)(1:8) & (260:21) (261:18) & approximate (33:20) & (186:15) (187:1) \\
\hline \((2: 2)(2: 4)(5: 5)(6: 14)\) & (261:23) & (178:11) & (187:2) (215:6) \\
\hline \((7: 11)(7: 25)(8: 20)\) & answered (125:2 & approximately & (238:19) (238:21) \\
\hline \((14: 11)(16: 13)(17: 1)\) & anticipate (200:4) & approximation (35: & asinine (141:1) asks (112:21) \\
\hline \((17: 17)(21: 24)(21: 25)\) & (209:6)
anticipated (208:13) & \[
\begin{aligned}
& (177: 10)(177: 17) \\
& \text { april }(221: 9)
\end{aligned}
\] & aspect (201:3) \\
\hline \((22: 1)(22: 11)(23: 9)\)
\((77: 11)(79.22)(81: 5)\) & \begin{tabular}{l}
anticipated (208:13) \\
anybody (16:3)
\end{tabular} & \begin{tabular}{l}
april (221:9) \\
arbitrarily (35:1)
\end{tabular} & aspects (203:1) \\
\hline \((77: 11)(79: 22)(81: 5)\)
\((82: 8)(83: 3)(86: 4)\) & \begin{tabular}{l}
anybody (16:3) \\
anymore (41:16)
\end{tabular} & |arbitrarily (35:1)
|arbitrary (8:8) & assembling (62:2) \\
\hline \((82: 8)(83: 3)(86: 4)\)
\((111: 8)(118: 3)(139: 6)\) & \begin{tabular}{lr} 
anymore & \((41: 16)\) \\
anyone & \((150: 16)\)
\end{tabular} & \[
(65: 21)
\] & (62:3) \\
\hline \((141: 19)(142: 5)\) & anytime (271:4) & area (16:5)(17:25) & assert (113:2) \\
\hline (142:9) (143:24) & anywhere (73:12) & (24:12) (26:23) (27:4) & asserting (172 \\
\hline \((147: 5)(174: 25)\) & (74:9)(156:11) & (47:7) (58:11) (58:14) & assess (156:8)(213:4) \\
\hline \((176: 4)(176: 5)(263\) & apologize (216:20 & \((58: 19)(72: 19)(72: 24\) & ssessed (191) \\
\hline (263:12) (273:3) (286:4) & apparent (147:23) & \((74: 22)(75: 4)(85: 6)\) & ssessment \\
\hline allow (26:14)(234:8) & apparently (86:3) & \((86: 15)(126: 1)\) & (156:2) (198:22) \\
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\hline allowable (272:11) & \((121: 4)(122: 21)\) & \((175: 22)(176: 3)\) & (212:7) (212:16) \\
\hline (280:14) & appeal (1:7) & \((176: 7)(176: 8)\) & (213:6) (260:23) \\
\hline allowance (185:11) & \((117: 12)(117: 13)\) & (176:17) (191:25) & (262:2) (262:5) (262: \\
\hline allowed (88:15) & \((117: 20)(186: 25)\) & (192:1) (205:23) & (262:9) \\
\hline \((89: 25)(183: 12)\) & (187:1) (216:7) & \((227: 17)(243: 24)\) & assign (137:11) \\
\hline (184:7) (272:13) & (216:18) (218:19) & (272:10) & assigned (65:23 \\
\hline allows (49:24) & (218:20) (238:2) & areas (15:8) (23:2) & assist (230:17) \\
\hline almost (23:6)(35:25) & (252:16) (258:5) & \((81: 4)(143: 2)(175: 22)\) & (281:12) \\
\hline \((63: 22)(64: 14)(95: 9)\) & (265:8) (270:1) (270:9 & (227:14) (271:25) & assistant (2:2) \\
\hline \((159: 25)(160: 22)\) & appealant's (4:20) & aren't (59:11) & (65:25) \\
\hline \((167: 21)(214: 23)\) & appealed (186:24) & (60:12) (236:25) (240:1 & te \\
\hline (281:5) & (216:5) (218:18) & arguably (20:23) & (144:25) \\
\hline along (46:19) & appeals (187:3) & \((27: 2)(35: 21)\)
(34:20) (67:25 & \begin{tabular}{l}
associated (17:13) \\
\((82: 16)(84: 3)(125: 23)\)
\end{tabular} \\
\hline (227:22) (268:15) & appeal's (219:17) & argue \((34: 20)(67: 25\) & (82:16) (84:3) (125:23)
\[
(140: 12)
\] \\
\hline although (114:18) & \begin{tabular}{l}
appearances (2:1) \\
appears (70:19)
\end{tabular} & \begin{tabular}{l}
argued (166:22) \\
argument (6:3)(53:22)
\end{tabular} & \begin{tabular}{l}
(140:12) \\
association (137:20)
\end{tabular} \\
\hline \((123: 2)(232: 25)\)
\((248: 3)(276: 22)\) & \[
\begin{array}{ll}
\text { appears } & (70: 19) \\
(233: 8) &
\end{array}
\] & \begin{tabular}{ll} 
argument & \((6: 3)(53: 22)\) \\
arguments & \((113: 20)\)
\end{tabular} & assume (136:15) \\
\hline (248:3)(276:22)
altogether (27 & appellant & arisen (70:10) & \((136: 16)(136: 17)\) \\
\hline \[
\begin{aligned}
& \text { altogether (27: } \\
& \text { amazing (161:4) }
\end{aligned}
\] & appellant's (218:25) & arose (198:24) & \((138: 22)(138: 23)\) \\
\hline ambient (19:2)(19:7) & appellee (1:10) & around (12:12) & (151:7) \\
\hline \((21: 15)(83: 22)\) & appendices (264:4) & (78:20) (158:3) & assumes (272:16) \\
\hline (134:17) (208:7) & application (164:19) & \[
\begin{aligned}
& (188: 19)(191: 23) \\
& (227: 17)(243: 25)
\end{aligned}
\] & \[
(272: 25)
\]
\[
(29: 9)
\] \\
\hline \((254: 2)(254: 6)(255: 1)\) & (165:1) (185:14)(191:2) & \[
\begin{aligned}
& (227: 17)(243: 25) \\
& (266: 8)
\end{aligned}
\] & \[
\begin{array}{|l}
\text { assuming }(29: 9) \\
(88: 11)(88: 14)(90: 2)
\end{array}
\] \\
\hline (255:6) (255:14) & applied (114:25) & (266:8) (204:11) & \[
(101: 12)(169: 25)
\] \\
\hline (255:24) (262:13) & (115:25) (214:18) & arsenal (204:11) & \[
(200: 16)(231: 12)
\] \\
\hline (262:15) (262:16) & applies (11:19) & \[
(204: 14)
\] & \[
\begin{aligned}
& (200: 16)(231: 12) \\
& (282: 24)(283: 1)
\end{aligned}
\] \\
\hline \(\begin{array}{ll}\text { ambiguity } & (280: 17) \\ \text { america's } & (85: 7)\end{array}\) & (20:7)(24:24) & \[
\begin{aligned}
& \text { article } \quad(7: 10)(8: 10) \\
& (23: 7)(24: 3)(24: 5)
\end{aligned}
\] & assumptions (147:17) \\
\hline \(\begin{array}{lc}\text { america's } & (85: 7) \\ \text { ammonia } & (74: 10)\end{array}\) & \[
\left\lvert\, \begin{array}{ll}
\operatorname{apply} & (6: 24)(6: 25) \\
(9: 15) & (92: 8)(117: 4)
\end{array}\right.
\] & \((23: 7)(24: 3)(24: 5)\)
\((24: 8)(49: 17)(50: 2)\) & \[
(148: 11)(149: 5)
\] \\
\hline ammonia \((74: 10)\)
\((74: 12)(74: 15)(226: 11)\) & \((120: 10)(140: 2)\) & \((63: 18)(65: 4)(66: 3\) & (150:2) (150:4) (150:11) \\
\hline amount (42:17)(45:2) & \((153: 11)(153: 12)\) & \((68: 1)(93: 10)(93: 16)\) & assurance (202:22) \\
\hline \((79: 14)(88: 8)(101: 12)\) & (235:4) (236:13) & \((95: 13)(96: 10)(99: 14)\) & assure (280:5) \\
\hline \((143: 4)(178: 8)(183: 7)\) & approach (23:23) & \((99: 15)(101: 11)\) & atmosphere (43:10) \\
\hline (183:8) (183:20) & (26:24) (55:22) (156:10) & \[
(102: 23)(126: 21)
\] & (43:15) (46:1) (72:20)
\[
(73: 23)(74: 6)(75: 13)
\] \\
\hline (184:4) (200:20) \({ }^{(2088}\) & appropriate (125:12) & \[
(145: 25)(155: 21)
\]
\[
(164: 5)(165: 19)
\] & \[
\begin{aligned}
& (73: 23)(74: 6)(75: 13) \\
& (76: 9)(76: 13)(192: 13)
\end{aligned}
\] \\
\hline (200:21) (203:2) (248:8) & (125:14) (140:20) & \[
(164: 5)(165: 19)
\] & \[
(198: 9)
\] \\
\hline amounts (42:5) & (280:5) & (166:21) (175:16) & (198:9) \\
\hline analysis (8:15) & approval (17:24) & \[
\begin{aligned}
& (181: 10)(182: 6) \\
& (187: 12)(187: 14)
\end{aligned}
\] & \begin{tabular}{l}
attached (69:5) \\
attachment (69:11)
\end{tabular} \\
\hline
\end{tabular}
\begin{tabular}{|c|c|c|c|}
\hline attain & & & comes \\
\hline (69:12) & (174:12) & (20:5) (29:20) (95:9) & (127:18) (127:21) \\
\hline attain (24:12) & background (35:23) & \((136: 3)(207: 8)\) & (128:11) (128:14) \\
\hline (28:20) (143:24) & (84:3) (105:15) & (207:14) (208:4) (209:3) & (128:21) (129:2) \\
\hline attain- (27:21) & (142:19) (142:22) & bates (119:16) & (129:6) \((130: 11)\) \\
\hline (273:18) & \((143: 10)(144: 16)\) & \((119: 22)(124: 10)\) & (132:17) (133:13) \\
\hline attainable (8:14) & (144:19) (144:22) & (132:22) (212:1) & \[
(133: 21)(13
\] \\
\hline attaining (134:4) & (145:3) (160:18) & (212:11) & \[
(134: 14
\] \\
\hline attainment (15:10) & \((160: 20)(160: 23)\) & batteries (11 & \[
\text { / } 13
\] \\
\hline \((17: 5)(17: 25)(20: 9)\) & (161:3) \({ }^{\text {(16) }}\) & \((11: 6)(11: 9)(11: 20)\)
\((12: 18)(12: 20)(13: 4)\) & \[
(151: 24)(152: 23)
\] \\
\hline \[
\begin{aligned}
& (26: 2)(26: 3)(26: 6) \\
& (26: 16)(26: 17)(27:
\end{aligned}
\] & backsliding & \((12: 18)(12: 20)(13: 4)\)
\((13: 5)(85: 8)(85: 9)\) & \[
(161: 13)(161: 17)
\] \\
\hline (27:21) (27:23) (29:4) & bad (194:3) & \((85: 12)(93: 24)(94: 20)\) & (161:21) (161:22) \\
\hline (182:11) (196:12) & bag (45:22)(45:25) & \((107: 11)(109: 4)\) & (162:5) (163:5) \\
\hline (273:4) (273:13) & (192:8) (193:9) & (115:25) (116:21) & (163:22) (163:23) \\
\hline \((273: 15)(273: 16)\) & (193:19) (197:15) & \((134: 10)(134: 13)\) & (164:21) (166:3) \\
\hline (273:19) (273:21) & (197:20) (197:23) & (150:14) (152:2) & \((166: 14)(166: 15)\) \\
\hline \((273: 22)(274: 2)\) & (198:1) (209:12) & \((152: 22)(153: 3)\) & (170:21) (177:20) \\
\hline (274:3) (274:4) (274:8) & baking (37:15) & (153:11) (153:15) & (177:24) (178:9) \\
\hline (274:10) (274:13) & barreling (178:8) & (154:14) (156:16) & (188:17) (189:15) \\
\hline \((274: 15)(274: 20)\) & base (130:13) & (161:17) (161:20) & (191:12) (192:25 \\
\hline \((275: 2)(275: 6)(275: 7)\) & (133:12) (153:24) & (162:1) (162:5) (162:8) & (193:3) (193:6) \\
\hline attempted (86:5) & (280:4) & (162:9) (162:12) & (193:17) (195:3) \\
\hline attempting (172:21) & based (7:16)(8:14) & (162:16) (162:21) & (195:6) (195:7) \\
\hline attempts (180:2) & \((10: 2)(10: 4)(17: 12)\) & (162:25) (163:8) & (195:13) (195:15) \\
\hline attend (231:17) & \((20: 3)(20: 4)(28: 15)\) & \((163: 17)(170: 23)\) & (195:17) (195:21) \\
\hline attention (240:12) & (53:9) (63:7) (67:21) & \((178: 4)(178: 5)\)
\((195: 14)(195: 17)\) & \[
(196: 10)(196: 13)
\] \\
\hline attorney (112:2)
\[
(112: 6)(112: 9)
\] & \((75: 18)(128: 15)\)
\((128: 18)(128: 22)\) & \((195: 14)(195: 17)\)
\((195: 20)(195: 23)\) & (196:15) (196:17) \\
\hline (286:10) (286:12) & \((129: 5)(130: 11)\) & \((195: 25)(196: 1)\) & \((196: 18)(197: 16)\) \\
\hline attorney-client & \((133: 25)(145: 18)\) & \((199: 19)(199: 22)\) & \((198: 10)(204: 21)\) \\
\hline attracted (192:21) & \((145: 22)(148: 20)\) & (200:6) (200:7) & (209:7) (209:12) \\
\hline attributable (75:18) & (158:10) (167:14) & (200:11) (200:15) & (209:19) (209:24) \\
\hline (212:5) (212:9) & (199:25) (208:24) & (204:22) (209:15) & (209:25) (220:20) \\
\hline (212:15) (212:23) & (229:7) (244:2) & (209:17) (210:5) & (221:5) (221:9) \\
\hline \((213: 10)(213: 14)\) & (255:12) (260:23) & (211:8) (220:5) & (221:17) (222:4) \\
\hline august (110:19) & (261:1) & (220:12) (220:14) & (227:19) (238:8) \\
\hline (110:22) & baseline (52:13) & (220:21) (221:22) & \[
(238: 10)(238: 13)
\] \\
\hline authority (22:15) & \((54: 1)(93: 18)(106: 20)\) & (221:25) (222:10) & (241:16) (242:5) \\
\hline (22:17) (26:7) & (106:23) (106:25) & \((227: 20)(235: 20)\) & \[
(253: 18)(254: 21)
\] \\
\hline automatically (199:4) & \((107: 3)(107: 6)\) & \((237: 4)(237: 6)\)
\((237: 14)(237: 2\) & \[
(254: 24)(255: 4)
\] \\
\hline (71:14) (99:3) (99:7) & (108:11) (108:13) & \((238: 3)(238: 6)\) & (255:19) (255:20) \\
\hline \((132: 11)(144: 5)\) & (108:16) (108:20) & \((238: 16)(239: 18)\) & (257:9) (257:14) \\
\hline \((148: 20)(194: 18)\) & (109:7) (109:15) & \((247: 10)(247: 16)\) & (257:18) (261:5) \\
\hline (207:14) (208:5) & (109:16) (109:18) & (247:24) (253:11) & (261:15) (262:3) \\
\hline (209:3) (223:15) (276:1) & \((109: 23)(123: 4)\) & \((254: 14)(254: 18)\) & (262:14) (262:20) \\
\hline avalon (21:20) & (123:9) (123:22) & (254:19) (254:20) & (264:22) (264:25) \\
\hline (21:21) (72:5) (79:19) & (125:10) (157:16) & (254:22) (256:8) & (265:4) (265:9) (266:1) \\
\hline \((80: 16)(82: 9)(83: 4)\) & (157:17) (168:20) & (261:17) (270:16) & (266:2) (266:3) (266 \\
\hline \((83: 21)(84: 1)(84: 7)\) & (169:5) (169:13) & (278:8) (278:9) (278:15 & (266:11) (267:4) \\
\hline avenue (27:15) & (169:16) (169:24) & battery (11:20) & \[
(267: 6)(267: 12)
\] \\
\hline average (17:7)(52:5) & (170:11) (170:15) & \[
\begin{aligned}
& (12: 10)(12: 13)(12: 15) \\
& (12: 20)(13: 1)(13: 2)
\end{aligned}
\] & \[
\begin{aligned}
& (268: 7)(268: 13) \\
& (268: 21)(268: 22)
\end{aligned}
\] \\
\hline (54:2)(83:2) (105:2) & (252:18) (252:19) & \[
\begin{aligned}
& (12: 20)(13: 1)(13: 2) \\
& (34: 17)(37: 2)(41: 12)
\end{aligned}
\] & \begin{tabular}{l}
(268:21) (268:22) \\
(275:17) (275:18)
\end{tabular} \\
\hline \((105: 3)(158: 5)(169: 1)\)
\((284: 16)\) & \((253: 4)(253: 10)\)
\((256: 7)(267: 11)\) & \[
\begin{aligned}
& (34: 17)(37: 2)(41: 12) \\
& (41: 25)(45: 4)(45: 8)
\end{aligned}
\] & \[
\begin{aligned}
& (275: 17)(275: 18) \\
& (275: 21)(277: 13)
\end{aligned}
\] \\
\hline averages (284:15) & (267:14) (267:19) & \((45: 12)(45: 15)(46: 16)\) & (277:18) (278:24) \\
\hline averaging (169:3) & (268:2) (269:15) & \((48: 25)(49: 10)(49: 16)\) & (280:8) (282:4) (282:5) \\
\hline aware (56:11) (66:14) & basic (169:2) & \((50: 6)(50: 14)(57: 15)\) & (283:21) \\
\hline (68:20) (129:9) (139:5) & basically (15:6) & \((58: 7)(63: 5)(80: 4)\) & bazaar (147:12) \\
\hline (149:1) (150:21) & (18:14) (20:4) (22:16) & \((94: 18)(94: 20)(94: 23)\) & beam (33:8)(179:20) \\
\hline (157:6) (163:21) & (23:21) (23:22) (24:24) & \((94: 24)(95: 16)(108: 2)\)
\((108: 7)(108: 10)\) & bearing (8:5)
\[
(171: 24)(217: 2)
\] \\
\hline (182:5) (191:20) & \((25: 7)(25: 11)(26: 8)\)
\((33: 11)(33: 19)(37: 24)\) & \[
(108: 7)(108: 10)
\]
\[
(114: 25)(115: 14)
\] & beat (108:21) (108:25) \\
\hline (191:23) (192:4) & \((33: 11)(33: 19)(37: 24)\)
\((50: 2)(51: 22)(53: 18)\) & \[
\begin{aligned}
& (114: 25)(115: 14) \\
& (115: 17)(116: 22)
\end{aligned}
\] & beate (170:15) \\
\hline (201:20) (204:11) & \((54: 25)(57: 17)(58: 23)\) & \((116: 24)(117: 6)\) & became (65:9)(97:23) \\
\hline \((205: 7)(236: 1)(245: 4)\) & \((59: 4)(59: 8)(59: 12)\) & \((117: 23)(118: 11)\) & (104:3) (104:5) \\
\hline (251:12) & \((60: 20)(63: 14)(65: 3)\) & (118:16) (120:10) & become (26:20) \\
\hline B & \((65: 15)(73: 5)(79: 18)\)
\((142: 24)(167: 23)\) & \[
\begin{aligned}
& (122: 24)(123: 2) \\
& (123: 9)(123: 21)
\end{aligned}
\] & (136:3) \((273: 18)\)
becomes (37:17) \\
\hline babst (2:6) & (276:24) & \[
\begin{aligned}
& (124: 22)(125: 10) \\
& (125: 19)(126: 7)
\end{aligned}
\] & \[
\begin{aligned}
& (103: 16)(126: 21) \\
& (185: 8)(190: 1)
\end{aligned}
\] \\
\hline
\end{tabular}
\begin{tabular}{|c|c|c|c|}
\hline becoming & & & ause \\
\hline becoming (281:4) & (101:3) (101:5) & (234:17) (234:19) & (105:3) (184:20) \\
\hline began (66:17) & \((158: 22)(204: 19)\) & breakdowns (105:18) & (191:15) \\
\hline begin (7:1)(158:6) & bigger (34:22) & (222:9) (222:13) & calland (2:6) \\
\hline (192:13) & biggest (35:15) & breaking (248:5)
breathe
(20:15) & \[
\text { called }(10: 8)(11: 22)
\]
\[
(11: 23)(12: 2)(14: 1)
\] \\
\hline beginning (104:21) & (148:7)(148:15) (161:1)
billion (81:12) & \[
\begin{aligned}
& \text { breathe }(20: 15) \\
& \text { breathing } \quad(36: 5)
\end{aligned}
\] & \[
(19: 7)(33: 6)(37: 14)
\] \\
\hline \((105: 1)(189: 18)\)
\((189: 19)(189: 20)\) & billion (81:12) & \[
\begin{aligned}
& \text { breathing }(36: 5) \\
& (82: 12)
\end{aligned}
\] & \[
(38: 5)(136: 5)(139: 11)
\] \\
\hline \((266: 15)(274: 25)\) & binary (89:23) & bricks (275:19) & \((173: 16)(176: 10)\) \\
\hline begins (211:17) & binder (110:14) & brief (4:20)(218:24) & (177:8) (185:12) \\
\hline (212:2) (229:25) & (119:11) (119:12) & (219:15) (219:16) & (20) \\
\hline behalf (113:24) & (214:6) (244:17) & (228:1) & (250:6) (250:8) (278:6) \\
\hline believed (149:8) & binders (172:8) & briefly (168:17) & \[
(280: 4)
\] \\
\hline (149:12) & (215:12) & bringing (222:12) & \[
\begin{array}{|l}
\text { cancer }(44: 18) \\
(82: 21)(82: 24)(83: 6)
\end{array}
\] \\
\hline bell (266:18) & bit (5:24)(6:10)
\((18: 24)(47: 17)(56: 8)\) & \[
\begin{aligned}
& (222: 13) \\
& \text { broad }(18: 9)(93: 10)
\end{aligned}
\] & \[
(209: 9)(223: 6)(225: 11)
\] \\
\hline belong (11:14)
below (29:3)(58:14) & \((18: 24)(47: 17)(56: 8\)
\((59: 5)(62: 1)(93: 3)\) & \[
(149: 6)(274: 5)
\] & canopy (193:15) \\
\hline (72:11) (77:2) (102:24) & (106:19) (117:23) & broader (175:24) & (194:19) \\
\hline \((124: 14)(130: 5)\) & \((126: 10)(134: 24)\) & (176:1) & capability (24: \\
\hline (160:22) (203:8) & \((134: 25)(137: 1)\) & brochure (228:16) & capture \\
\hline benefit (50:23) & (145:6) (157:22) & brother (6:9) & \[
(193: 18)(194: 4)
\] \\
\hline (165:20) (166:23) & (191:4) (235:22) & brought (167:1) & \[
\begin{aligned}
& (193: 18)(194: 4) \\
& (194: 15)
\end{aligned}
\] \\
\hline (188:9) & \[
\begin{aligned}
& (246: 12)(249: 7) \\
& (252: 21)(276: 24)
\end{aligned}
\] & \[
\begin{aligned}
& (167: 15) \\
& \text { brunt } \quad(8: 3)
\end{aligned}
\] & \[
\begin{aligned}
& (194: 15) \\
& \text { captured } \quad(45: 9)
\end{aligned}
\] \\
\hline benefited (166:1) & \[
\begin{aligned}
& (252: 21)(276: 24) \\
& \text { blood }(20: 16)(223: 9)
\end{aligned}
\] & \begin{tabular}{ll} 
brunt & \((8: 3)\) \\
btex & \((40: 9)(44: 20)\)
\end{tabular} & \[
(95: 12)(193: 11)
\] \\
\hline benzene (37:21) & (225:16) (225:18) & \((44: 23)(51: 5)(51: 6)\) & (197:15) (197:20) \\
\hline \((38: 2)(40: 9)(43: 23)\) & blowing (35:9) & (51:7) (79:11) (79:14) & (197:23) \\
\hline \((44: 23)(51: 6)(81: 1)\) & board (67:5)(96:16) & (156:22) (168:7) & captures (193:7) \\
\hline \((81: 2)(81: 5)(81: 23)\) & \((96: 21)(98: 23)(99: 16)\) & (197:22) (197:23) & capturing \\
\hline \((82: 2)(82: 20)(82: 24)\) & (100:16) (100:20) & (198:3) (198:9) (209:7) & (257 \\
\hline (84:5) (84:11) (209:7) & (101:18) (104:11) & \[
\begin{aligned}
& (249: 16)(282: 2) \\
& \text { btu }(38: 7)
\end{aligned}
\] & car (45:20)
carbon 137: \\
\hline (209:10) (223:13) & \((104: 24)(105: 5)\)
\((127: 7)(180: 12)\) & build (188:18) & carcinogenicity \\
\hline \((223: 14)(223: 18)\)
\((224: 11)(224: 15)\) & \((127: 7)(180: 12)\)
\((180: 14)(180: 15)\) & \[
(196: 10)
\] & care (49:22) (50:3) \\
\hline (232:24) (233:1) & \((180: 16)(242: 19)\) & building (1:14)(2:3) & \((59: 23)(152: 21)(230: 4)\) \\
\hline (249:16) (271:17) & (242:25) & (19:23) & career (64:10) \\
\hline besides (44:16) & \[
\begin{aligned}
& \text { boilers } \quad(25: 12) \\
& (25: 13)
\end{aligned}
\] & \[
\begin{array}{ll}
\text { bullet } & (246: 20) \\
(246: 24) & (247: 4)
\end{array}
\] & \[
\begin{aligned}
& (147: 10) \\
& \text { careful } \quad(222: 12)
\end{aligned}
\] \\
\hline best (25:11)(25:14) & bolded (227:7) & (247:19) (248:14) & (243:5) \\
\hline \((31: 18)(31: 22)(35: 14)\) & booklet (64:23) & bump (47:16) & carefully (275:25) \\
\hline (128:5) (181:21) & books (273:11)(282:7) & \begin{tabular}{l}
bunch (230:23) \\
burden (8:5)(8:17)
\end{tabular} & \[
\begin{array}{ll}
\text { carries } & (234: 10) \\
\text { carryover } & (216: 23)
\end{array}
\] \\
\hline \((201: 23)\)
\((243: 25)\)
\((251: 8)\)
\((257: 19)\) & borough (229:9)
boss (114:9)(120:7) & \[
\begin{aligned}
& \text { burden } \quad(8: 5)(8: 17) \\
& (13: 7)
\end{aligned}
\] & \[
\begin{aligned}
& \text { carryover }(216: 23) \\
& \text { cars }(35: 23)(36: 5)
\end{aligned}
\] \\
\hline \((243: 25)(257: 19)\)
\((271: 13)(280: 6)\) & boss \((114: 9)(120: 7)\)
both \((7: 24)(13: 9)\) & bureau (14:11) & cart (39:7) \\
\hline (281:8) (281:14) & (18:19) (21:14) (46:14) & (65:10) (85:19) (125:2) & carve (212:8) (212:14 \\
\hline (281:16) & (47:9) (56:5) (65:14) & bureaus (65:19) & carved (211:22) \\
\hline better (30:19)(47:3) & \((81: 15)(91: 25)(92: 1)\) & burned (58:1)(75:8) & carves (211:12) \\
\hline \((49: 8)(51: 25)(54: 5)\) & (92:11) (138:5) & burning (35:17) & \[
\begin{aligned}
& \text { carving }(213: 13) \\
& \text { case }(5: 4)(5: 16)
\end{aligned}
\] \\
\hline \((54: 6)(54: 8)(54: 9)\)
\((54: 10)(54: 12)(56: 8)\) & \((138: 20)(158: 13)\)
\((162: 17)(175: 14)\) & \[
\begin{aligned}
& (57: 20) \\
& \text { bus }(6: 1)
\end{aligned}
\] & case \((5: 4)(5: 16)\)
\((9: 3)(9: 25)(10: 6)\) \\
\hline \((54: 10)(54: 12)(56: 8)\)
\((162: 4)(162: 6)\) & \((162: 17)(175: 14)\)
\((196: 4)(223: 21)\) & business (112:20) & \((10: 20)(11: 10)(11: 13)\) \\
\hline \((178: 20)(194: 25)\) & \((224: 14)(236: 12)\) & C & \((18: 18)(80: 12)(85: 11)\) \\
\hline \((197: 2)(232: 1)(245: 8)\) & (242:15) (253:14) & C & \((94: 17)(98: 2)(99: 22)\) \\
\hline (249:2) (257:21) & (275:12) (275:14) & calculate (30:8) & (100:1) (104:7) \\
\hline (267:8) (268:24) & bottom (26:15)(84:1) & (103:17) (103:18) & (110:10) (130:16) \\
\hline (271:23) & (85:3) (97:16) (119:17) & (176:23) (176:25) & (131:3) (146:23) \\
\hline between (46:15) & (119:25) (122:1) & ```
calculated (104:14)
(107:6) (109:10)
``` & (172:7) (181:21)
\[
(190: 21)(198: 19)
\] \\
\hline \((46: 17)(57: 17)(58: 11)\) & (124:12) (212:1) & \[
\begin{aligned}
& (107: 6)(109: 10) \\
& (213: 1)(266: 21)
\end{aligned}
\] & (190:21) (198:19)
\[
(244: 4)(265: 2)
\] \\
\hline \((58: 13)(58: 15)(69: 21)\)
\((81: 18)(91: 10)(101: 1)\) & \((229: 5)(249: 1)(264: 5)\)
bouncing (158:3) & \[
\begin{aligned}
& \text { (213:1)(266:21) } \\
& \text { calculating (65:4) }
\end{aligned}
\] & \[
(278: 19)(279: 4)
\] \\
\hline \((81: 18)(91: 10)(101: 1)\)
\((104: 11)(120: 4)\) & bouncing (158:3)
bound (164:7)(182:1) & calculation (93:19) & (280:23) \\
\hline (140:15) (140:16) & braddock (72:4) & (102:5) (106:20) & cases (177:7) \\
\hline \((151: 15)(158: 3)\) & brand (59:22) & \((106: 23)(107: 1)\) & (179:17) (191:5) (191:6) \\
\hline (164:18) (164:24) & bread (37:1) (37:3) & (107:7) (107: 18) & catalytic (76:3) \\
\hline (165:19) (180:2) & \((37: 8)(38: 24)(45: 13)\) & \[
\begin{aligned}
& (107: 22)(108: 1) \\
& (108: 13)(108: 20)
\end{aligned}
\] & catch (42:9)(42:24) caught (197:19) \\
\hline (193:14) (193:22) & \((58: 9)(58: 11)(58: 12)\)
\((58: 14)(94: 3)\) & \[
\begin{aligned}
& (108: 13)(108: 20) \\
& (109: 8)(109: 15)
\end{aligned}
\] & \begin{tabular}{l}
caught (197:19) \\
cause (72:14)(76:4)
\end{tabular} \\
\hline \((209: 21)(263: 8)\)
\((264: 16)\) & \((58: 14)\)
break
( \(94: 3)\)
\((43: 15)(76: 12)\) & \[
\begin{aligned}
& (109: 8)(109: 15) \\
& (109: 24)(109: 25)
\end{aligned}
\] & \[
(110: 7)(150: 16)
\] \\
\hline (264:16)
beyond ( \(45: 7)(51: 18)\) & break
\((76: 14)\)
\((78: 15)(76)(78: 13)\) & \((123: 4)(168: 20)\) & (181:1) (204:7) (223:5) \\
\hline \[
(70: 7)(140: 14)
\] & \((78: 16)(78: 19)(106: 7)\) & (252:18) (253:4) & \((223: 6)(223: 7)(223: 8)\) \\
\hline (181:24) (218:12) & \((116: 22)(126: 1)\) & (253:10) & (223:11) (223:18) \\
\hline big \((39: 6)(43: 10)\) & \((217: 14)(230: 7)\) & calculations (32:11) & (224:12) (225:10) \\
\hline
\end{tabular}
caused
combusting
\begin{tabular}{|c|c|c|c|}
\hline (225:11)(245:2) & charge (41:10) & (118:22)(139:8) & \((37: 14)(37: 17)(38: 6)\) \\
\hline caused (151:20) & charged (188:16) & \((143: 13)(143: 14)\) & \((38: 13)(38: 17)(38: 22\) \\
\hline (151:24) (204:8) & (188:17) (189:1) & \((144: 25)(146: 25)\) & \((39: 1)(39: 3)(39: 7)\) \\
\hline (243:16) & (189:4) (189:10) & (148:9) (150:7) & \((39: 15)(39: 22)(40:\) \\
\hline causes (11:8)(11:9) & \((189: 14)(189: 16)\) & (154:11) (159:18) & \((40: 6)(40: 8)(40: 13)\) \\
\hline \((11: 10)(44: 7)(44: 14)\) & \((189: 21)(189: 23)\) & \((159: 23)(175: 20)\) & \((40: 23)(41: 10)(41: 1\) \\
\hline \((223: 8)(223: 9)\) & \((190: 10)(191: 8)\) & \((175: 23)(184: 25)\) & \((41: 19)(41: 25)(42: 3)\) \\
\hline (225:12) (225:13) & (221:12) (222:3) & (185:1) (186:1) & \((42: 20)(43: 9)(44: 21)\) \\
\hline (225:17) (225:18) & charging ( \(40: 12\) ) & (204:20) (204:22) & \((45: 4)(45: 8)(45: 12)\) \\
\hline causing (6:9)(20:16) & (41:5) (41:6) (59:24) & (227:10) (227:16) & \((45: 16)(46: 9)(48: 25)\) \\
\hline \((208: 6)(209: 9)\) & (60:9) (266:10) & (228:18) (229:10) & \((50: 6)(50: 13)(57: 12)\) \\
\hline ceiling (19:23) & chart (83:8)(84:1) & \((233: 22)(235: 5)\) & \((57: 20)(57: 24)(57: 25\) \\
\hline cell (223:5) (223:15) & (144:7) & \((235: 20)(235: 23)\) & \((58: 24)(59: 1)(59: 8)\) \\
\hline (223:17) (224:18) & charts (231:11) & (236:2) (236:6) & \((59: 13)(59: 22)(60: 4)\) \\
\hline cells (82:4)(224:17) & check (140:23) & \((236: 13)(236: 23)\) & (60:6) (73:6) (74:14) \\
\hline (225:16) & chemical (41:24 & (241:10) (241:13) & \((75: 23)(75: 24)(77: 10)\) \\
\hline cems (32:22) & \((42: 11)(174: 12)\) & (245:1) (247:10) & (79:20) (79:24) (81:3) \\
\hline center (1:13) ( \(2: 7\) ) & (192:18) (192:19) & (247:16) (247:20) & (81:13) (83:23) (8 \\
\hline central (225:14) & chemicals (42:1 & (247:24) (250:2) & (8) \\
\hline (225:19) & (205:16) (209:9) & (251:9) (252:9) & (153:11) (153:16) \\
\hline certain (7:21)(11:4) & (271:4) (271:6) (282:3) & (254:22) (266:6) & (154:6) (156:18) \\
\hline (26:10) (26:12) (26:17) & (282:9) & clarification (187:5) & (163:18) (164:21) \\
\hline \((30: 13)(45: 6)(93: 5)\) & chemical's (38:10) & clarify (39:14) & (166:13) (166:15) \\
\hline \((93: 7)(99: 4)(101: 12)\) & chemistry (43:3) & (112:23) (114:11) & (167:5) (167:12) \\
\hline \((102: 23)(115: 5)\) & (43:6) & (116:7) (117:3) (117:7) & (167:22) (167:24) \\
\hline (177:14) (195:17) & cherry (116:17) & (117:8) (117:15) & \((168: 14)(170: 20)\) \\
\hline (237:19) & chief (14:17)(125:2) & clarifying (284;6) & \((177: 22)(193: 16)\) \\
\hline certainly (61:1) & child (80:14) (223:7) & classes (174:19) & (193:18) (200:22) \\
\hline \((176: 22)(180: 23)\) & (225:12) & classified (224:17) & (201:9) (201:13) \\
\hline \((186: 6)(186: 7)\) & chimney (95:2)(265:5) & clean (15:6)(15:9) & (201:18) (202:12) \\
\hline (191:19) (199:15) & chinese (230:19) & \((16: 9)(16: 10)(16: 12)\) & (202:17) (205:23) \\
\hline (200:7) (207:13) & chlormethine (226:13) & \((16: 15)(16: 16)(16: 23)\) & (210:4) (210:6) \\
\hline (209:23) (240:18) & chromatid (223:20) & \((17: 22)(18: 5)(18: 16)\) & (221:13) (222:20) \\
\hline \((243: 6)(246: 5)(249: 6)\) & (224:13) & \((19: 4)(19: 13)(19: 15)\) & (223:2) (223:16) \\
\hline (274:3) (274:14) & chromium (226:7) & \((22: 13)(22: 17)(23: 10)\) & (224:21) (224:22) \\
\hline (274:16) (275:17) & chromosomal (223:19) & \((24: 13)(25: 3)(25: 4)\) & (225:6) (226:4) \\
\hline (277:25) & (224:12) & \((26: 7)(28: 10)(39: 4)\) & (227:10) (227:13) \\
\hline certainty (116:5) & chronic (83:7) & \((192: 22)(222: 20)\) & (233:22) (249:16) \\
\hline certificate (286:1) & (223:18) (224:11) & (223:2) (223:16) & (257:14) (257:18) \\
\hline certification & chunk (37:24) & (224:21) (270:21) & (266:5) (270:19) \\
\hline certified (64:1) & circle (85:10) & cleaned (57:21) & (270:21) (270:22) \\
\hline (135:17) (135:21) & (248:14) (249:2) & cleaner (8:19) & (270:25) (271:3) \\
\hline (136:2) (138:15) & circling (201:1) & (217:16) & (278:9) (278:23) \\
\hline \((138: 21)(138: 25)\) & circumstance (6:8) & cleanest (143:3) & (282:5) (282:6) \\
\hline (139:5) (141:7) & cite (201:21) & cleaning (230:2) & (283:11) (283:15) \\
\hline certify (136:1) & (202:21) (203:9) & clear (47:22) (50:8) & coked (39:3)(40:18) \\
\hline (286:7) (286:10) & \((203: 10)(203: 20)\) & (65:17) (95:22) (124:4) & \((41: 14)(41: 20)\) \\
\hline chain (110:15) & \((203: 25)(228: 17)\) & (145:23) (148:19) & coking (41:25) \\
\hline \((110: 16)(112: 2)\) & (228:23) & (224:4) (229:12) & (43:11) (80:3)(85 \\
\hline (112:7) (112:11) & c-i-t-e (201:21) & (239:24) (264:15) & \[
(151: 16)
\] \\
\hline (113:6) (120:4) & citizens (8:20) & \[
(265: 19)
\] & cold (275:19)(275:20) coleen (220:1) \\
\hline chance (34:21) & (227:2)(242:16) & \begin{tabular}{l}
clients (172:20) \\
clock (274:20)
\end{tabular} & colleagues (246:2) \\
\hline (68:16) (86:21) & city (84:21) (84:23) & clock (274:20) &  \\
\hline change (43:6) & civil (8:11) (48:3) & (274:21)(274:23) & collect (38:14) \\
\hline (181:17) (190:19) & (48:9) (48:14) (65:2) & clogs \((58: 20)\)
close \((34: 17)(37: 5)\) & \begin{tabular}{l}
(45:22) \\
collected (38:1)
\end{tabular} \\
\hline (220:5) (220:20) & \((65: 24)(67: 24)(97: 20)\) & \[
\begin{aligned}
& \text { close }(34: 17)(37: 5) \\
& (37: 15)(68: 22)
\end{aligned}
\] & collected (38:1)
\[
(45: 20)(45: 25)(197: 19)
\] \\
\hline (242:17) (243:1) & \((198: 11)\)
\((214: 19)(216: 32)\) & (37:15) (68:22) closely (73:2) & \begin{tabular}{l}
collecting \\
(41:12)
\end{tabular} \\
\hline changed (9:8)(100:7) & \((214: 19)(216: 3)\)
\((216: 10)(218: 14)\) & \[
\begin{array}{lr}
\text { closely } & (73: 2) \\
\text { closer } & (81: 14)(84: 3)
\end{array}
\] & \[
(41: 15)(45: 14)(57: 18)
\] \\
\hline \((100: 10)(105: 7)\)
\((144: 8)(196: 9)\) & clack (1:13) & closing (80:2) & college (174:5) \\
\hline changes (160:5) & claim (10:5) (114:19) & coal (37:11)(37:13) & co-located (21:13) \\
\hline (231:7) & claiming (111:11) & (37:17) (37:18) (40:14) & column (167:6) \\
\hline changing (148:18) & clairton (4:11) & \((40: 18)(41: 2)(42: 24)\) & (167:8)(167:11)
com (58:23) (59:4) \\
\hline (181:15) (181:20) & (9:14) (11:3) (11:6) & (57:13) & com (58:23)(59:4)
\[
(157: 6)(169: 6)
\] \\
\hline (190:7) & \((11: 20)(12: 10)(13: 4)\) & coke (11:5)(11:7)
\[
(11: 21)(11: 23)(12: 15)
\] & combination (19:24) \\
\hline chapter (4:14) & \[
(73: 6)(74: 14)(75: 23)
\]
\[
(75: 24)(77: 10)(79: 24)
\] & (11:21) (11:23) (12:15) \((13: 2)(13: 5)(24: 9)\) & \[
\text { combine }(73: 18)
\] \\
\hline (206:12) (206:23) & \[
\begin{aligned}
& (75: 24)(77: 10)(79: 24) \\
& (84: 21)(84: 22)(84: 23)
\end{aligned}
\] & \[
\begin{aligned}
& (13: 2)(13: 5)(24: 9) \\
& (25: 16)(25: 17)(27: 2)
\end{aligned}
\] & \[
(76: 14)
\] \\
\hline characterize & \((86: 11)(87: 7)(87: 10)\) & \((27: 4)(30: 3)(30: 5)\) & combust (42:4)(43:12) \\
\hline characterizing & \((91: 16)(92: 8)(94: 21)\) & \((32: 15)(36: 18)(36: 20)\) & \begin{tabular}{l}
combusted (59:2) \\
combusting (58:15)
\end{tabular} \\
\hline charcoal (4:10)(79:9) & \((105: 20)(107: 11)\) & \((36: 22)(37: 1)(37: 4)\) & combusting (58:15) \\
\hline
\end{tabular}
\begin{tabular}{|c|c|c|c|}
\hline \multicolumn{2}{|l|}{combustion} & \multicolumn{2}{|r|}{content} \\
\hline combustion (42:8) & (227:2) (227:4) & comport (8:11) & (114:21) (115:10) \\
\hline (42:19) (42:24) (57:8) & (248:19) (251:9) & composition (42:12) & \((117: 24)(118: 6)\) \\
\hline \((57: 10)(58: 8)(58: 19)\) & (251:20) (251:23) & compound (76:9) & \[
(120: 23)(122: 17)
\] \\
\hline \((76: 6)(94: 25)(200: 14)\) & complete (206:13) & (81:24) (35.18) & \[
\begin{aligned}
& (122: 24)(123: 3) \\
& (124: 23)(125: 15)
\end{aligned}
\] \\
\hline (211:7) (239:17) & (231:5) (233:12) & compounds (35:18)
\[
(36: 3)(44: 2)(197: 13)
\] & \[
\begin{aligned}
& (124: 23)(125: 15) \\
& (125: 17)(157: 5)
\end{aligned}
\] \\
\hline (264:22) (264:25) & completed (71:12) & \[
\begin{aligned}
& (36: 3)(44: 2)(197: 13) \\
& (197: 17)
\end{aligned}
\] & \[
\begin{aligned}
& (125: 17)(157: 5) \\
& (169: 19)(198: 14)
\end{aligned}
\] \\
\hline (268:15)
comes
\((33: 15)(35: 1)\) & \[
\begin{array}{|ll}
\text { (231:14) } & \\
\text { completely } & (101: 19)
\end{array}
\] & \begin{tabular}{l}
(197:17) \\
comprehensive
\end{tabular} & \[
(198: 24)(211: 10)
\] \\
\hline comes
\((38: 3)(38: 15)(38: 25)\) & completely
\((200: 18)(209: 23)\) & computer (29:11) & (211:13) (211:23) \\
\hline \((39: 23)(57: 15)(57: 17)\) & complex (9:21)(9:22) & coms (32:20)(32:21) & (212:9) (212:15) \\
\hline (73:15) (127:16) & compliance (28:9) & (33:6) (52:6) (52:7) & (213:14) (239:20) \\
\hline \((143: 10)(192: 19)\) & (29:7) (29:14) (29:15) & \((52: 13)(57: 3)(57: 7)\) & (240:2) (247:11) \\
\hline (192:20) (200:13) & \((46: 24)(47: 1)(49: 7)\) & \((57: 23)(58: 2)(58: 5)\) & (247:12) (247:16) \\
\hline comfortable (62:20) & \((50: 13)(51: 23)(52: 5)\) & \((59: 17)(59: 22)(60: 15)\) & (248:6) (262:24) \\
\hline coming (28:9)(29:25) & \((52: 21)(53: 3)(53: 4)\) & \((60: 22)(61: 6)(61: 11)\) & (263:3) \\
\hline \((30: 24)(41: 13)(44: 3)\) & \((54: 2)(54: 4)(54: 21)\) & \((61: 22)(95: 7)(108: 4)\) & (263:17) (263:21) \\
\hline \((58: 19)(58: 25)(68: 20)\) & \((60: 8)(61: 13)(100: 22)\) & \((108: 10)(117: 24)\) & (263:24) (264:8) \\
\hline \((79: 14)(143: 8)\) & \((101: 7)(101: 8)\) & (123:9) (125:4) (125:9) & \[
(267: 5)(267: 16)
\] \\
\hline \((176: 16)(179: 22)\) & (101:22) (102:10) & (125:24) (137:13) & \[
(267: 23)(26
\] \\
\hline \((192: 21)(193: 24)\) & \((102: 13)(104: 15)\) & (157:2) (157:6) & consequence \\
\hline \((198: 2)(228: 20)\) & (105:7) (106:25) & \((157: 18)(157: 20)\) & \begin{tabular}{l}
(216:23) \\
consequences
\end{tabular} \\
\hline (248:4) (248:15) & \((107: 10)(108: 2)\) & \((157: 24)(168: 21)\)
\((169: 15)(169: 17)\) & consider (1.52:5) \\
\hline \((271: 15)\)
comment
col2:4)
(117:10) & \((111: 12)(111: 15)\)
\((114: 5)(116: 22)\) & \((169: 15)(169: 17)\)
\((169: 21)(169: 22)\) & (152:12) (158:25) \\
\hline \((117: 13)(117: 21)\) & \((116: 25)(117: 23)\) & \((170: 5)(170: 8)\) & (181:19) (181:20) \\
\hline \((118: 5)(124: 21)\) & (118:12) (118:25) & (238:14) (265:1) & (208:25) (234:9) (268:4) \\
\hline \((129: 17)(227: 9)\) & (119:2) (120:15) & \((267: 18)(268: 24)\) & considerably (164:4) \\
\hline (242:20) (242:21) & \((121: 10)(121: 12)\) & (277:12) & consideration \\
\hline comments (124:14) & (121:22) (122:20) & concede (233:21) & \[
\begin{aligned}
& (7: 5)(7: 19)(9: 2) \\
& (29: 6)(31: 10)(88
\end{aligned}
\] \\
\hline (124:16) (127:9) & (140:7) (159:21) & conceivable (161:25) & \[
(88: 21)(89: 7)(89
\] \\
\hline (148:1)(242:24) & \((160: 8)(160: 14)\) & concentrations & \[
(89: 9)(119: 7)(162: 18)
\] \\
\hline \begin{tabular}{l}
commission (286:18) \\
commissioned (286:6)
\end{tabular} & \[
(169: 15)(169: 18)
\] & concern (46:1) & (176:20) (180:9) \\
\hline committee (127:5) & \((170: 13)(170: 18)\) & \((65: 15)(270: 15)\) & \((180: 13)(181: 3)\) \\
\hline \((180: 11)(242: 19)\) & \((171: 6)(171: 18)\) & (274:8) (274:17) & (181:6) (183:16) \\
\hline (242:25) & (203:17) (204:3) & concerned (6:1) & (272:7) (272:12) \\
\hline common (118:2) & (251:6) (253:10) & (6:21) (7:1) (7:4) & \[
(272: 13)(272: 22)
\] \\
\hline (263:6) (263:12) & (253:15) (253:18) & (12:5) (36:21) (42:14) & \begin{tabular}{l}
considerations \\
considered (66:4)
\end{tabular} \\
\hline commonwealth (22:8) & (254:25) (255:5) & \begin{tabular}{l}
( \(81: 16\) ) ( \(147: 25\) ) \\
(190:6) (272:23)
\end{tabular} & \[
(70: 10)(130: 2)
\] \\
\hline (31:4) (208:9) (286:2) & (255:6) (255:9) & \[
\text { concerning }(6: 15)
\] & \[
(142: 19)(152: 9)
\] \\
\hline \[
\begin{aligned}
& (286: 7) \\
& \text { communicated (113:7) }
\end{aligned}
\] & \((255: 10)(255: 13)\)
\((255: 23)(256: 7)\) & \((175: 19)(233: 16)\) & considering (31:19) \\
\hline communication & (259:2) (259:3) (259:8) & concerns (8:25) & (181:15) (184:19) \\
\hline communications & (266:15) (267:12) & (55:4) (55:9) (55:22) & consiatency (137:20) \\
\hline community (152:6) & (267:15) (267:18) & \((86: 20)(232: 9)\) & (138:2) \\
\hline companies (33:5) & (268:20) (268:24) & concession (233:25) & consistent (10:11) \\
\hline (99:3) (205:17) & (269:8) (272:15) & concessions (280: & \[
\begin{aligned}
& (65: 16)(65: 20)(68: 1) \\
& (278: 25)
\end{aligned}
\] \\
\hline company (139:10) & (272:16) (272:25) & conclude (285:7) & \[
\begin{aligned}
& (278: 25) \\
& \text { consistently (135:8) }
\end{aligned}
\] \\
\hline (181:4) (182:18) & \[
\begin{aligned}
& (273: 4)(273: 12) \\
& (280: 12)(280: 13)
\end{aligned}
\] & \begin{tabular}{l}
conclusion (256:5) \\
condition (209:17)
\end{tabular} & consistently (135:8)
\[
(135: 9)
\] \\
\hline \((185: 8)(185: 9)\) & \[
\begin{aligned}
& (280: 12)(280: 13) \\
& (282: 24)(283: 1)(283:
\end{aligned}
\] & condition (209:17)
\[
(266: 5)(276: 11)
\] & constant (16:4) \\
\hline \((194: 25)(196: 9)\)
\((196: 22)(197: 9)\) & compliant (12:1) & (276:12) & constitute (182:6) \\
\hline \((199: 4)(202: 12)\) & (12:11) (105:11) & conditioned (209:18) & consultation (62:24) \\
\hline (205:11) (220:10) & \((106: 10)(154: 20)\) & conditions (27:25) & consulted (66:5) \\
\hline (220:11) (226:3) & (169:24) (171:5) & \[
(28: 24)(144: 23)
\] & consulting (66:15) \\
\hline \((242: 16)(250: 6)\) & \[
\begin{aligned}
& (238: 23)(267: 8) \\
& (284: 1)(284: 10)
\end{aligned}
\] & \[
\begin{aligned}
& (181: 1)(207: 22) \\
& (221: 10)(222: 1)(231: 1)
\end{aligned}
\] & \begin{tabular}{ll} 
consume & \((62: 1)\) \\
contain & \((192: 12)\)
\end{tabular} \\
\hline (271:11)
compare (250:21) & \[
\begin{array}{|l}
\begin{array}{l}
(284: 1)(284: 10) \\
\text { compliants } \quad(251: 16)
\end{array}
\end{array}
\] & \[
\begin{aligned}
& \begin{array}{l}
(221: 10)(222: 1)(231: 1) \\
\text { conference } \quad(244: 6)
\end{array}
\end{aligned}
\] & contain \((192: 12)\)
\((192: 15)(198: 3)\) \\
\hline compare (250:21) compared (75:3) & \begin{tabular}{lr} 
compliants & \((251: 16)\) \\
complicated & \((38: 21)\)
\end{tabular} & confidence (149:16) & (198:5) (198:6) \\
\hline \[
(75: 22)(87: 6)
\] & \[
(197: 3)
\] & conflict (124:4) & containment (192:12) \\
\hline compares (95:12) & complied (269:4) & conflicts (49:20) & contains (42:20) \\
\hline (260:13) (260:16) & comply (15:9) & confuse (7:1)(75:6) & \((44: 22)(44: 25)\) \\
\hline (260:19) & (166:24) (207:19) & confused (18:10) & \[
(201: 12)(237: 18)
\] \\
\hline comparison (80:24) & (208:16) (269:3) & confusing (74:19) & \begin{tabular}{l}
(271:3) (282:7) \\
contemplate (87:20)
\end{tabular} \\
\hline (204:19) (252.23) & complying (50:1) & connected (246:22) & \[
(88: 5)(88: 8)(198: 13)
\] \\
\hline complain (252:23) & component (43:10)
\[
(48: 13)(75: 17)(158: 7)
\] & consecutive (48:8) & \[
(198: 23)
\] \\
\hline complaint (146:3)
\[
(146: 4)(146: 11)
\] & \[
(223: 18)
\] & consent (56:11) & contemplated (8:10) \\
\hline \((227: 3)(227: 6)(227: 7)\) & components (38:9) & (60:25) (61:3) (69:6) & (211:13) \\
\hline (227:8) & (42:7) (42:9) (42:22) & \((69: 22)(69: 23)(70: 6)\) & contemplation \\
\hline complaints (86:20) & \((44: 16)(52: 8)\) & \((70: 14)(70: 22)\) & \\
\hline
\end{tabular}
\begin{tabular}{|c|c|c|c|}
\hline contents & & & dausch \\
\hline contents (231:19) & \[
(2: 12)(5: 4)(62: 8)
\] & & D \\
\hline & c & (238:22) (238:24) & daily (65:25) \\
\hline (47:14) (217:14) & \((8: 13)(48: 4)(93: 1)\) & \((240: 7)(240: 16)\) & damage (11:9)(11:11) \\
\hline continued (27:6) & (93:3) (159:2) (255:12) & (241:1) (241:19) & \((82: 4)(151: 24)(223: 6)\) \\
\hline \((47: 19)(77: 8)(196: 16)\) & correctly (12.5:22) & (242:13) (243:2) & (223:8) (223:9) \\
\hline (196:20) (199:16) & \((140: 25)(161: 14)\)
\((185: 19)(185: 20)\) & \((243: 3)(245: 15)\)
\((246: 8)(248: 20)\) & \[
\begin{aligned}
& (225: 11)(225: 15) \\
& (225: 17)(225: 18)
\end{aligned}
\] \\
\hline continues (72:12)
\((101: 21)(249: 3)\) & \((185: 19)(185: 20\)
\((245: 6)(261: 25)\) & (249:23) (250:14) & damp \((41: 15)\) \\
\hline (276:21) & (264:23) & (251:12) (251:17) & damping (59:6) \\
\hline continuing (54:13) & correlating (270:24) & (251:20) (252:7) & dark (42:5)(137: \\
\hline (54:14) (54:17) (77:3) & correspondence & \[
\begin{aligned}
& (263: 6)(263: 8) \\
& (263: 12)(264: 16)
\end{aligned}
\] & \[
\begin{aligned}
& (137: 9) \\
& \text { data }(12: 23)(17: 20)
\end{aligned}
\] \\
\hline \((199: 11)(270: 5)\)
\((273: 22)\) & cost (10:24)(11:11)
(152:13) & \[
\begin{aligned}
& (263: 12)(264: 16) \\
& (266: 21)(273: 3)
\end{aligned}
\] & data \((12: 23)(17: 20)\)
\((30: 1)(31: 24)(31: 25)\) \\
\hline continuous (29:24) & costing & \((283: 3)(283: 17)\) & \((52: 14)(57: 3)(60: 15)\) \\
\hline \((32: 22)(33: 7)(52: 14)\) & costs (17:13) & (286:4) (286:7) & \((61: 22)(61: 23)(7\) \\
\hline \((95: 6)(95: 7)(179: 18)\) & couldn't (25:24) & county's (6:14) & \((71: 11)(71: 12)\) \\
\hline (196:20) (202:1) & (66:8) (74:8)(87:13) & (10:17) (22:7) (131:11) & (71:16) (71:17) (71:18) \\
\hline (202:9) (211:7) (239:17) & (102:4) (109:9) & (139:6) (218:24) & \((73: 14)(86: 16)(87: 2)\) \\
\hline continuously (177:3) & \((138: 12)(139: 2)\) & (235:8) (248:23) & \[
(87: 4)(87: 14)(87: 16)
\]
\[
(87: 17)(88: 25)(95: 12)
\] \\
\hline (200:15) & (163:23) (169:9) & \[
\begin{aligned}
& \text { county-wide }(20: 22) \\
& \text { courle }(6: 2)
\end{aligned}
\] & \((87: 17)(88: 25)(95: 12)\)
\[
(128: 21)(129: 3)
\] \\
\hline contractors (63:11)
contractor's (63:9) & \[
\begin{aligned}
& \text { council (67:13) } \\
& (125: 6)(127: 13)(243: 2)
\end{aligned}
\] & \[
\text { course }(74: 14)(75: 8)
\] & \[
(129: 5)(129: 8)(129: 9)
\] \\
\hline contradiction & counsel (5:6)(56:2) & (174:21) & \[
(129: 21)(129: 22)
\] \\
\hline contrary (8:10) & (79:3) (91:10) (111:23) & courses (174:17) & \[
\begin{aligned}
& (129: 23)(129: 24) \\
& (130: 1)(130: 2)
\end{aligned}
\] \\
\hline contribute (84:7)
\((160: 3)\) & \((112: 15)(113: 8)\)
\((113: 10)(161: 14\) & \(\begin{array}{ll}\text { court } & (4: 25)(5: 20)\end{array}\) & \[
(130: 10)(130: 12)
\] \\
\hline contributes (159:25) & \((171: 2)(224: 1)(251: 8)\) & (118:2) (173:17) & (141:9) (144:4) (144:8) \\
\hline contributing (208:6) & (286:10) (286:12) & (263:6) (263:12) & \((147: 5)(148: 1)(148: 2)\) \\
\hline contribution (22:7) & count (178:4) & cover (141:21) & (148:20) (148:21) \\
\hline (35:15) (72:19) (73:7) & (188:19) (188:21) & (193:15) (198:12) & (149:11) (149:15) \\
\hline (73:8) (73:24) & (189:5) & \((229: 24)(240: 1)(266: 2)\) & (149:18) (149:19) \\
\hline contributions (84:5) & counted (191:6) & covered (175:16) & \((149: 22)(149: 23)\) \\
\hline (84:11) (87:7) & counties (176:4) & (240:2) & \[
\begin{aligned}
& (150: 1)(175: 8) \\
& (175: 19)(178: 19)
\end{aligned}
\] \\
\hline \begin{tabular}{ll} 
contributor (73:12) \\
contributors & \((241: 14)\)
\end{tabular} & \[
\begin{aligned}
& \text { counting } \quad(184: 20 \\
& (188: 23)(190: 3)
\end{aligned}
\] & \begin{tabular}{ll} 
covers & \((85: 6)\) \\
create & \((35: 19)\)
\end{tabular} & \[
(179: 1)(222: 19)
\] \\
\hline control (13:3) & country (9:16) & \((37: 14)(38: 12)(38: 13)\) & (223:15) (226:1) \\
\hline \((22: 10)(22: 16)(24: 25)\) & (16:11) (20:24) (25:13) & \((75: 7)(75: 10)(99: 17)\) & (230:24) (230:25) \\
\hline \((32: 10)(34: 9)(34: 10)\) & \((27: 3)(91: 17)(153: 25)\) & (261:5) & (231:8) (231:11) \\
\hline \((35: 22)(45: 16)(46: 10)\) & \((160: 2)(160: 20)\) & created (8:13)(12:3) & (231:13) (232:12) \\
\hline \((53: 19)(55: 23)(86: 23)\) & county (1:2)(1:8) & (96:4) (105:1) (154:7) & \[
\begin{aligned}
& (232: 16)(233: 8) \\
& (241: 7)(249: 3)
\end{aligned}
\] \\
\hline \((174: 18)(193: 2)\) & \((2: 2)(2: 4)(5: 5)(7: 11)\) & (177:25) (75.8) & \[
\begin{aligned}
& (241: 7)(249: 3) \\
& (250: 21)(258: 24)
\end{aligned}
\] \\
\hline (193:3) (193:6) (196:5) & \((7: 25)(8: 20)(8: 25)\)
\((9: 1)(9: 5)(9: 8)(9: 20)\) & \begin{tabular}{l}
creates (75:8) \\
creating (161:23)
\end{tabular} & \((250: 21)(258: 24)\)
\((259: 1)(259: 2)(259: 3)\) \\
\hline \((196: 22)(196: 23)\)
\((203: 19)(227: 19)\) & \((9: 1)(9: 5)(9: 8)(9: 20\)
\((9: 23)(10: 14)(10: 21)\) & creating (161:23) & (259:8) \((259: 15)\) \\
\hline \((278: 12)(279: 1)(279: 7)\) & \((11: 24)(12: 4)(14: 11)\) & cringe (36:25) & (259:17) (259:18) \\
\hline controlled (20:7) & \((16: 13)(17: 1)(17: 7)\) & criteria (7:21) & (272:2) (272:4) (274:6) \\
\hline (26:9) (161:6) (193:20) & \((17: 17)(21: 4)(22: 12)\) & \((15: 10)(16: 20)(16: 21)\) & (274:7) (274:9) \\
\hline (209:11) & (23:9) (47:13) (47:14) & \((16: 22)(17: 9)(17: 10)\) & (274:11) (277:3) \\
\hline controlling (194:22) & \((47: 16)(47: 19)(55: 3)\) & \[
(18: 1)(19: 3)(19: 14)
\] & \[
(281: 15)
\] \\
\hline controls (28:18) & \((56: 14)(64: 6)(67: 12)\) & \[
\begin{aligned}
& (19: 21)(20: 10)(21: 11) \\
& (21: 16)(24: 14)(27: 11)
\end{aligned}
\] & \[
\begin{aligned}
& \text { date }(5: 3)(8: 12) \\
& (53: 2)(70: 8)(82: 17)
\end{aligned}
\] \\
\hline (28:21) (183:10) & \((77: 12)(86: 4)(91: 19)\) & (21:16) (24:14) (27:11) &  \\
\hline \((192: 5)(192: 8)(193: 7)\) & \((91: 25)(92: 1)(92: 11)\) & \[
(28: 11)(42: 17)(42: 23)
\] & \[
(128: 17)(188: 7)
\] \\
\hline (194:12) (195:1) & \((92: 14)(93: 8)(93: 15)\) & \[
(43: 20)(71: 22)(72: 17)
\] & \[
\begin{aligned}
& (215: 23)(218: 3) \\
& (221: 1)(248: 24)
\end{aligned}
\] \\
\hline (196:12) (243:25) & \((93: 18)(111: 8)(116: 7)\) & \[
\begin{aligned}
& (143: 20)(156: 19) \\
& (240: 4)(243: 12)
\end{aligned}
\] & \[
\begin{array}{ll}
(221: 1) & (248: 24) \\
\text { dated }(220: 3)
\end{array}
\] \\
\hline (257:15) (257:19) & \[
(118: 3)(127: 13)
\] & \[
\begin{array}{ll}
(240: 4) & (243: 12) \\
\text { cross } & (20: 16)(217: 6)
\end{array}
\] & dausch (2:5)(3:4) \\
\hline (274:24)(278:24)
conversion (75:18) & \((130: 22)(131: 7)\)
\((132: 5)(132: 7)\) & cross (20:16)(217:6) cross-examination & \[
\begin{aligned}
& \text { dausch }(2: 5)(3: 4) \\
& (3: 5)(3: 7)(3: 8)(5: 12)
\end{aligned}
\] \\
\hline (76:2) & \((132: 14)(138: 6)\) & crux (7:3) (166:4) & \((8: 22)(8: 24)(13: 13)\) \\
\hline convert (75:12) & \((138: 10)(138: 18)\) & cubic (76:25)(202:15) & (13:15) (13:18) (90:5) \\
\hline (198:8) & \((139: 13)(139: 24)\) & cumbersome (185:8) & \[
(90: 7)(90: 9)(90: 13)
\] \\
\hline converted (81:7) & (140:5) (141:19) & cumulative (124:25) & \[
\begin{aligned}
& (90: 15)(90: 18)(90: 24) \\
& (91: 2)(91: 8)(91: 15)
\end{aligned}
\] \\
\hline cooking (37:13) & \((142: 5)(142: 9)\) & \[
\begin{aligned}
& \text { current } \quad(8: 11)(14: 8) \\
& (20: 20)
\end{aligned}
\] & (91:2) (91:8) (91:15)
\[
(97: 8)(97: 10)(106: 18)
\] \\
\hline cool (39:11) & \((142: 12)(142: 15)\)
\((143: 1)(143: 3)(143: 8\) & \[
\begin{array}{|ll}
(20: 20) & \\
\text { currently } & (17: 4)
\end{array}
\] & \[
(112: 1)(112: 5)
\] \\
\hline copies (217:11)
copy \(\quad(79: 5)(206: 6)\) & \((143: 1)(143: 3)(143: 8)\)
\((143: 11)(143: 25)\) & \[
\begin{aligned}
& \text { currently (17:4) } \\
& (27: 2)(77: 12)(205: 4)
\end{aligned}
\] & (112:10) (112:17) \\
\hline \((217: 11)(244: 20)\) & \((144: 17)(144: 20)\) & (209:11) & (112:19) (113:5) \\
\hline corner (119:17) & \((147: 5)(148: 24)\) & cut (158:24)(159:5) & (113:13) (114:2) \\
\hline (119:25) & \((150: 18)(175: 1)\) & cycle (41:25) & (117:1) (119:14) \\
\hline corporation (1:4) & (176:4) (176:5) (182:3) & & \[
(120: 1)(125: 25)
\] \\
\hline
\end{tabular}
\begin{tabular}{|c|c|c|c|}
\hline \multicolumn{2}{|l|}{dausch's} & \multicolumn{2}{|r|}{disperse} \\
\hline (131:17) (131:23) & degree (15:25) & (258:24) & diagrams (233:18) \\
\hline (141:20) (142:1) & degrees (37:16) & derived (258:15) & dictates (19:4)(65:3) \\
\hline \((154: 22)(168: 17)\) & delaware (1:4) & (258:21) (261:22)
\((262: 4)\) & \begin{tabular}{l}
differ (250:20) \\
differences (70:5)
\end{tabular} \\
\hline (168:19) (170:24) & \[
\begin{array}{ll}
\text { delegated } & (22: 21) \\
\text { deleqative } & (22: 15)
\end{array}
\] & \[
\begin{aligned}
& (262: 4) \\
& \text { deriving } \quad(132: 16)
\end{aligned}
\] & differences (70:5)
\[
(140: 14)(140: 16)
\] \\
\hline \((172: 4)(172: 14)\)
\((173: 5)(210: 10)\) & \begin{tabular}{ll} 
delegative & \((22: 15)\) \\
demonstrate & \((8: 5)\)
\end{tabular} & \begin{tabular}{ll} 
deriving & \((132: 16)\) \\
describe & \((41: 8)\)
\end{tabular} & \[
(151: 17)
\] \\
\hline (210:11) (210:17) & (15:10) (18:23) (51:20) & \((41: 23)(42: 13)(44: 1)\) & differently (198:18) \\
\hline \((213: 24)(214: 4)\) & (272:9) (273:9) (275:2) & (65:1) (192:16) & difficult (32:16) \\
\hline (214:6) (214:8) & (276:2) & (219:25) (279:25) & (134:19) (150:12) \\
\hline \((214: 10)(217: 4)\) & demonstrated (49:5) & described (95:5) & (176:25) (189:13) \\
\hline (217:13) (218:1) & (53:20) (60:16) & \[
(228: 21)
\] & \begin{tabular}{l}
\[
(252: 24)(252: 25)
\] \\
difficulties (181:5)
\end{tabular} \\
\hline \((228: 1)(228: 5)\)
\((229 \cdot 19)(230: 10)\) & (275:22) (277: 6)
demonstrates (11 & \[
\begin{aligned}
& \text { deserves (111:16) } \\
& (114: 6)
\end{aligned}
\] & \[
\begin{aligned}
& \text { difficulties (181:5) } \\
& \text { digits (167:21) }
\end{aligned}
\] \\
\hline \((229: 19)(230: 10)\)
\((233: 4)(233: 25)\) & demonstrates
\[
(130: 2)
\] & designated (17:5) & \[
(167: 23)
\] \\
\hline (234:1) (234:23) & demonstrating (28:9) & (21:10) (176:3) & diligent (241:6) \\
\hline \((234: 25)(235: 2)\) & (55:19) (86:11) (275:1) & (273:19) (274:4) (275:7) & dilute (82:2) \\
\hline (244:21) (244:22) & demonstration & designation (72:23) & diminished (33 \\
\hline (269:19) (282:13) & denser (23:1) & designed (45:10) & dioxide (7:22) \\
\hline (282:14) (282:17) & densest (20:23) & \((45: 17)(45: 20)(46: 2)\) & (20:11) (198:7) (198:8) \\
\hline (284:4) (285:4) (285:6) & dep (205:8)(205:10) & \[
(194: 14)
\] & \[
\begin{aligned}
& (200: 9)(200: 13) \\
& (229: 3)(232: 5)
\end{aligned}
\] \\
\hline (285:9) \((285: 14)\)
dausch's \((234: 7)\) & department (1:2) & \begin{tabular}{l}
destroy (209:25) \\
destroying (275:18)
\end{tabular} & \[
\begin{aligned}
& (229: 3)(232: 5) \\
& (232: 17)(232: 21)
\end{aligned}
\] \\
\hline \[
\begin{aligned}
& \text { dausch's }(234: 7) \\
& \text { dave }(5: 14)
\end{aligned}
\] & \[
\begin{aligned}
& (1: 8)(2: 2)(2: 4)(5 \\
& (5: 7)(5: 9)(6: 14)
\end{aligned}
\] & detail (231:22) & \[
(232: 24)(281: 3)
\] \\
\hline david (2:10) & \((7: 12)(7: 18)(8: 3)\) & detailed (135:12) & \[
(281: 5)(282: 1)(283:
\] \\
\hline davis (220:1)(286:6) & (11:18) (12:6) (12:11) & \[
(146: 9)(146: 12)
\] & \[
\begin{aligned}
& (283: 9) \\
& \text { direct } \quad(3: 3)(3: 7)
\end{aligned}
\] \\
\hline day-to-day (6:21)
deal (152:13)(202:4) & \((13: 24)(14: 12)(16: 14)\)
\((17: 17)(23: 11)(51: 12)\) & ```
details (6:24)
deteriorate (268:5)
``` & \[
\begin{aligned}
& \text { direct } \quad(3: 3)(3: 7) \\
& (14: 3)(76: 19)(126: 11)
\end{aligned}
\] \\
\hline deal (152:13) \((202: 4)\)
\((238: 2)(238: 5)(238: 8)\) & \[
(56: 19)(86: 4)(95: 20)
\] & \[
(268: 18)(268: 19)
\] & \[
(140: 8)(145: 7)
\] \\
\hline (268:9) & \((96: 2)(99: 24)(100: 9)\) & (269:6) & (149:20) (173:19) \\
\hline dean (191:16) & (100:25) (104:14) & deteriorating (47:6) & (177:2) (179:23) \\
\hline death (31:21) & \((107: 6)(107: 9)\) & deterioration & \((234: 15)(234: 16)\) \\
\hline decades (9:4)(77:6) & (108:14) (109:6) & determine (12:7) & \[
(238: 25)(240: 12)
\] \\
\hline (182:21) (182:24) & (110:1) (111:8) & \[
(32: 16)(52: 3)(52: 21)
\] & \[
\begin{aligned}
& (246: 12)(278: 1) \\
& \text { direction } \quad(67: 9)
\end{aligned}
\] \\
\hline decades-long (47:10) & (113:25) (123:21) & \[
(54: 24)(60: 19)(61: 21)
\]
\[
(65: 3)(74: 21)(93: 11)
\] & \[
\begin{aligned}
& \text { direction (67:9) } \\
& (67: 21)(142: 15)
\end{aligned}
\] \\
\hline december ( \(1: 15\) )(5:1) & \((126: 14)(129: 5)\)
\((130: 10)(130: 15)\) & \[
\begin{aligned}
& (65: 3)(74: 21)(93: 11) \\
& (120: 22)(121: 2)
\end{aligned}
\] & \[
\begin{aligned}
& (67: 21)(142: 15) \\
& (232: 23)
\end{aligned}
\] \\
\hline decent (78:15) & \((132: 20)(133: 10)\) & \((127: 25)(136: 23)\) & directly (77:9) \\
\hline decided (220:10) & \((133: 25)(134: 16)\) & (140:24) (141:6) & (80:19) (80:20) (84:12) \\
\hline (220:11) & \((145: 24)(146: 3)\) & \((162: 11)(162: 15)\) & (220:16) (270:12) \\
\hline deciding (152:4) & \((146: 7)(146: 10)\) & (243:15) (245:1) & director (14:10) \\
\hline declining (55:23) & \((147: 6)(152: 5)\) & \[
(277: 23)
\] & \begin{tabular}{l}
\[
(56: 23)(67: 9)(85: 19)
\] \\
dirty (57:21)(192:20)
\end{tabular} \\
\hline deconstruct (63:10) & (152:12) (155:10) & determined (117:3)
\[
(211: 7)(239: 17)
\] & dirty (57:21)(192:20)
disagree (256:20) \\
\hline decrease (47:15) & \[
(164: 18)(175: 3)
\] & \begin{tabular}{l}
(211:7) (239:17) \\
determines (175:8)
\end{tabular} & \begin{tabular}{ll} 
disagree & \((256: 20)\) \\
discount & \((188: 15)\)
\end{tabular} \\
\hline (47:19) (101:22) & \[
\begin{aligned}
& (191: 17)(200: 2) \\
& (205: 25)(207: 13)
\end{aligned}
\] & \begin{tabular}{l}
determines (175:8) \\
determining (57:4)
\end{tabular} & discounting (189:23) \\
\hline \((200: 23)(204: 7)\)
\((229: 13)(248: 8)\) & (208:4) (209:2) (211:4) & deterrents (98:25) & (191:7) \\
\hline (262:10) (262:11) & \((236: 9)(239: 14)\) & (99:17) & discovery (130:16) \\
\hline decreases (245:10) & (242:6) (249:19) & detrimental (44:17) & \[
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\hline (262:5) (262:20) & departments (175:2) & develop (12:6)(19:6) & \begin{tabular}{l}
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\hline decree (124:23) & department's (8:9) & \[
\begin{aligned}
& (22: 9)(22: 17)(28: 14) \\
& (88: 9)(129: 22)(132: 7)
\end{aligned}
\] & discrepancy (188:4) discretion (8:9) \\
\hline dedicated (268:8)
deduce (52:12) & \[
\begin{aligned}
& (13: 7)(63: 8)(63: 11) \\
& (104: 10)(132: 16)
\end{aligned}
\] & developed (12:7) & (93:10) (155:18) \\
\hline defects (223:5) & (261:14) & \((25: 21)(65: 6)(65: 8)\) & discuss (183:9) \\
\hline (225:11) & dependant (74:8) & (127:1) (153:19) & (241:20) (242:16) \\
\hline deferred (191:10) & dependent (55:1) & (249:9) (249:22) & discussed (76:17) \\
\hline defined (16:23) & depending (11:11) & developing (127:24) & (77:11) (190:6) \\
\hline (19:3) (26:11) & (34:19) (160:19) & \[
(176: 6)
\] & \[
\begin{aligned}
& (190: 14)(214: 17) \\
& (242: 6)(246: 10)
\end{aligned}
\] \\
\hline defines (19:13) & \[
(281: 24)
\] & development (15:2)
\[
(22: 23)(25: 18)(68: 19)
\] & \[
\begin{aligned}
& (242: 6)(246: 10) \\
& (271: 11)(279: 21)
\end{aligned}
\] \\
\hline (24:25) (25:4)
definite (243:18) & depends (96:3)
\[
(101: 10)(149: 4)
\] & \[
\begin{aligned}
& (22: 23)(25: 18)(68: 19) \\
& (88: 11)(175: 19)
\end{aligned}
\] & discussing (83:1) \\
\hline definite (243:18)
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(19:9) & (257:3)
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develops (241:19) \\
deviate (155:10)
\end{tabular} & \[
\begin{aligned}
& (183: 11)(194: 21) \\
& (204: 4)
\end{aligned}
\] \\
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definitively (245:1)
\end{tabular} & deposition
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\hline degradation (55:21) & depression (225:14) & (180:23) & \[
\begin{aligned}
& (172: 25)(247: 9) \\
& (258: 18)
\end{aligned}
\] \\
\hline (151:18) (245:11) & \[
\text { dep's } \quad(66: 2)
\] & \begin{tabular}{l}
deviation (181:1) \\
device (32:11)(34:9)
\end{tabular} & \[
\begin{aligned}
& \text { (258:18) } \\
& \text { dispatcher's } \quad(202: 25)
\end{aligned}
\] \\
\hline degrade (58:16) & \[
\text { deputy }(14: 10)
\] & device (32:11)(34:9) & \begin{tabular}{l}
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disperse (34:15)
\end{tabular} \\
\hline degrading (159:20) (160:13) & (56:23) (65:10) (85:19) derive (2.58:18) & \[
\text { devices }(53: 19)
\] & \[
(34: 24)(35: 8)(82: 1)
\] \\
\hline
\end{tabular}

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emission
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\hline dispersed (227:18) & \((62: 24)(64: 5)(64: 8)\) & (159:12) (159:15) & (251:4) (262:13) \\
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\hline dispersion (34:11) & \((128: 11)(135: 7)\) & (192:21) (194:16) & effective (66:20 \\
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\hline (225:9) & (181:7) (189:17) & (220:4) (220:13) & (104:3) (104:6) \\
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\hline \((69: 21)(69: 25)(70: 1)\) & (262:8) (262:12) & (238:24) (239:13) & (151:6) (151:9) \\
\hline (70:2) (70:8) (70:10) & \((262: 15)(268: 6)\) & (247:4) (248:13) & effort (66:18) \\
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\hline (164:17) (164:24) & \((11: 23)(11: 25)(12: 13)\) & downward (77:3) & (22:22) (70:3) \\
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\hline disputes (70:4) & \((38: 24)(39: 15)(39: 16)\) & (77:9)(79:20) (79:23) & (86:21) \\
\hline dissuade (152:17) & \((39: 22)(40: 4)(41: 24)\) & (80:20) & eight (76:21) \\
\hline distance (81:19) & \((42: 2)(43: 4)(43: 8)\) & draft (66:22)(104:2) & (128:20) (128:21) \\
\hline (191:12) & \((43: 11)(46: 3)(46: 5)\) & (118:9) & (133:8) (133:13) \\
\hline distinct (175:3) & \((49: 1)(49: 13)(49: 18)\) & drive (1:24)(42:7) & (133:19) (143:17) \\
\hline distinction (165:13) & (50:16) (50:17) ( \(50: 20)\) & (252:2) & (143:18) (144:7) \\
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\hline distress (44:8) & (55:7) (59:23) (63:3) & driver's (187:21) & \((166: 8)(166: 12)\) \\
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\hline (71:7) (79:6) (92:10) & \((161: 13)(161: 15)\) & (221:25) & \((179: 10)(188: 7)(230: 4)\) \\
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\hline \((124: 25)(131: 10)\) & \((166: 15)(167: 5)\) & (286:5) & elevated (56:23) \\
\hline (131:14) (131:18) & \((167: 12)(167: 16)\) & duration (89:9) & (83:9) (83:18) (83:23) \\
\hline (132:22) (133:1) & \((170: 21)(178: 14)\) & \((178: 23)(179: 4)\) & eleven (12:19) \\
\hline \((133: 3)(133: 5)(133: 6)\) & (188:19) (189:14) & E & mail (4:5) \\
\hline (133:7) (133:11) & (209:6) (241:16) & & (110:14) (110:16) \\
\hline (133:12) (133:24) & \((242: 5)(243: 8)(257: 9)\) & earlier (20:8) & (110:19) (110:25) \\
\hline (141:12) (141:13) & (258:15) (260:13) & (57:11) (88:25) (92:5) & (111:5)(112:2) (112: \\
\hline \((148: 6)(149: 9)\) & \((260: 20)(260: 22)\) & \((93: 19)(94: 3)(95: 19)\) & (112:11) (113:6) \\
\hline \((149: 14)(150: 20)\) & (260:25) (261:5) & \((96: 8)(97: 1)(97: 22)\) & (120:4) (120:19) \\
\hline (172:17) (203:21) & (261:6) (261:16) & \((100: 16)(106: 20)\) & (122:1) (124:13) \\
\hline (214:22) (215:3) & (262:3) (262:14) & (108:5) (120:18) & (229:24) (245:23) \\
\hline (215:4) (215:5) (215:9) & (262:20) (270:14) & (122:11) (126:10) & (246:6) (246:8) (246:11) \\
\hline (215:11) (216:24) & (270:18) (271:5) & (137:2) (141:8) & eramils (91:9) \\
\hline \((217: 2)(219: 21)\) & (271:9)(272:5) & (143:21) (147:4) & emission (24:9) \\
\hline (221:1) (221:3) & (280:21) (283:19) & \((153: 4)(155: 20)\) & (28:2) (28:4) (28: \\
\hline (221:19) (221:20) & (283:22) & (166:2) (168:4) & (28:16) (28:18) \((28: 21)\) \\
\hline \((222: 16)(222: 18)\) & doors (11:19)(11:22) & (214:17) (239:23) & (29:13) (29:24) \((30: 22)\) \\
\hline \((224: 24)(224: 25)\) & \((11: 24)(12: 15)(13: 1)\) & (245:18) (249:17) & (31:24) (32:22) (33:17) \\
\hline \((225: 5)(227: 22)\) & \((13: 2)(39: 1)(39: 14)\) & \((276: 16)(277: 6)\) & (33:19) ( \(40: 17)(52: 6)\) \\
\hline (228:10) (234:10) & \((40: 1)(40: 3)(45: 9)\) & (279:21) (283:11) & (57:24) (59:10) (88:8) \\
\hline (236:11) (236:17) & \((49: 23)(49: 25)(50: 3)\) & early (186:19) & (106:3) (106:4) \\
\hline (239:7) (240:10) & \((60: 8)(88: 6)(105: 23)\) & easier (30:7)(32:7) & (107:16) (131:16) \\
\hline \((240: 13)(240: 22)\) & \((133: 22)(166: 20)\) & easiest (35:21) & (147:1) (149:17) \\
\hline (264:15) (278:4) & \((167: 20)(178: 10)\) & (124:9) & \((153: 8)(156: 13)\) \\
\hline documentation & \((188: 13)(188: 15)\) & easily (134:3) & (156:14) (156:22) \\
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(158: 11)(168: 5)
\] \\
\hline \((131: 12)(132: 2)\) & (189:5) (189:9) & economic (163:13) & \[
(177: 8)(177: 20)
\] \\
\hline (132:14) (148:14) & \((189: 10)(189: 23)\) & (221:10)(222:1)
edgar (185:1) & \[
\begin{aligned}
& (177: 23)(178: 1) \\
& (178: 10)(178: 23)
\end{aligned}
\] \\
\hline (187:11) (206:5) & \((190: 2)(190: 4)(191: 7)\)
\((194: 3)(197: 14)\) & edgar (185:1) edge (46:8) & \[
(178: 24)(179: 5)
\] \\
\hline (216:21) (226:24) & \((194: 3)(197: 14)\)
\((198: 3)(257: 17)(266: 8)\) & \begin{tabular}{l}
edge (46:8) \\
education (15:11)
\end{tabular} & \[
(179: 8)(179: 13)
\] \\
\hline dollar (61:8)
do3:20) & double-sided (217:1) & \((15: 19)(15: 24)(16: 4)\) & (194:7) (196:11) \\
\hline (111:16) (114:6) & doubt (129:8) & (174:15) (174:22) & \((196: 16)(196: 21)\) \\
\hline dollars (7:14)(9:7) & (140:14) (150:17) & effect (24:1)(48:15) & \((199: 18)(201: 6)\) \\
\hline \((10: 25)(206: 2)(214: 23)\) & (165:21) (166:24) & (48:16) \((98: 13)(99: 12)\) & (201:7) (208:9) \\
\hline don \((110: 25)(112: 23)\) & down \((36: 17)(39: 12)\) & (99:15) (101:11) & (208:16) (210:22) \\
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\hline done (12:7) (27:16) & \((76: 15)(83: 25)(84: 2)\) & \[
(103: 25)(155: 4)
\] & \[
\begin{aligned}
& (226: 4)(235: 19) \\
& (237: 19)(241: 10)
\end{aligned}
\] \\
\hline \((38: 22)(53: 20)(53: 22)\) & \((95: 3)(106: 7)(116: 22)\) & \[
(180 ; 6)(180 ; 21)
\] & (237:19) (241:10) \\
\hline
\end{tabular}
\begin{tabular}{|c|c|c|c|}
\hline (241:13) (254:8) & (198:4) (199:14) & (11:2) (11:15) (11:16) & entered (118:2) \\
\hline \((265: 17)(270: 25)\) & (200:9) (200:24) & \((12: 14)(13: 5)(13: 8)\) & (118:7) (263:5) (263: \\
\hline (271:8) (271:20) & (201:1) (201:3) (208:5) & \((46: 20)(47: 23)(50: 22)\) & enters \\
\hline (271:23) (271:24) & (208:10) (208:13) & \((51: 14)(61: 2)(61: 12)\) & entire (9:16) (10:17) \\
\hline \((272: 1)(273: 10)\) & (209:5) (237:14) & \((62: 10)(65: 14)(65: 18)\) & (10:19) (15:5) (22:25) \\
\hline (277:21) (280:8) & \((238: 3)(238: 5)(238: 9)\) & \((68: 19)(69: 5)(80: 7)\) & \((91: 17)(104: 18)\) \\
\hline \((280: 14)(281: 2)\) & \((238: 10)(238: 13)\) & \((80: 14)(85: 11)(86: 5)\) & (107:10) (112:7) \\
\hline (281:13) (281:18) & (240:1) (241:7) & (92:15) (92:21) (92:23) & (112:11) (139:19) \\
\hline (283:5) & (243:16) (244:25) & \((93: 13)(93: 21)(94: 11)\) & (264:21) (268:13) \\
\hline emissions (6:25) & (245:2) (246:2) (248:4) & \((95: 17)(95: 23)(98: 1)\) & (268:20) (268:22) \\
\hline \((9: 5)(10: 1)(10: 4)\) & (253:15) (253:19) & \((98: 17)(99: 9)(99: 25)\) & entirety (116:19) \\
\hline (12:25) (13:2) (19:11) & (253:21) (255:15) & \((102: 8)(102: 9)\) & enumerated (72 \\
\hline \((26: 20)(28: 2)(28: 3)\) & (257:13) (257:19) & \((106: 24)(107: 5)\) & environment (202:2) \\
\hline \((28: 22)(28: 25)(29: 17)\) & (262:6) (262:11) & \((107: 15)(107: 20)\) & (202:6) (202:7) (202: \\
\hline \((30: 4)(30: 6)(30: 7)\) & \((262: 20)(265: 11)\) & \((107: 24)(108: 8)\) & (203:14) \\
\hline \((30: 8)(30: 13)(30: 16)\) & (268:16) (268:17) & \((108: 9)(108: 11)\) & environmental (4:22) \\
\hline \((30: 23)(31: 4)(31: 10)\) & \((270: 13)(270: 19)\) & (108:17) (108:19) & (14:10) (14:23) (15:21) \\
\hline \((31: 17)(31: 18)(31: 20)\) & \((271: 12)(271: 14)\) & (109:6) (109:11) & (23:12) (65:10) (85:19) \\
\hline \((31: 22)(31: 23)(32: 1)\) & (272:4) (277:14) & \((109: 21)(110: 4)\) & (174:13) (191:21) \\
\hline \((32: 7)(32: 14)(32: 17)\) & (279:2) (279:21) & \((110: 23)(114: 18)\) & (228:19) (264:21) \\
\hline \((34: 2)(34: 5)(34: 6)\) & (279:22) (279:25) & \((114: 24)(115: 2)\) & \((265: 12)(266: 14)\) \\
\hline \((34: 16)(34: 20)(35: 20)\) & \((280: 1)(280: 6)(280: 7)\) & \((115: 20)(121: 1)\) & (267:1) \\
\hline \((35: 25)(36: 11)(36: 15)\) & \((280: 18)(280: 20)\) & \((123: 7)(123: 20)\) & epa (17:10)(17:17 \\
\hline \((39: 5)(39: 6)(40: 1)\) & (281:3) (281:23) & (124:5) (125:20) & \((17: 20)(17: 24)(18: 14)\) \\
\hline \((40: 14)(41: 18)(41: 21)\) & (282:8) (282:19) & \((126: 8)(132: 5)(132: 7\) & \((18: 17)(19: 3)(19\) \\
\hline \((43: 1)(44: 3)(44: 5)\) & (282:23) (283:14) & \((132: 18)(133: 20)\) & (19:17) (23:11) (23:19) \\
\hline \((45: 15)(45: 17)(45: 19)\) & emit (28:5)(247:1) & (140:19) (140:22) & \((23: 20)(23: 22)(24: 1)\) \\
\hline \((45: 21)(45: 24)(46: 3)\) & (255:15) & \((146: 18)(150: 23)\) & \((24: 7)(24: 8)(24: 18)\) \\
\hline \((46: 5)(46: 7)(46: 11)\) & emitting (36:5) & (152:5) (175:4) & \((24: 19)(25: 5)(27: 24)\) \\
\hline \((47: 10)(47: 11)(47: 14)\) & (43:9) (156:17) & (175:11) (175:12) & (29:19) (31:8) (33:3) \\
\hline \((47: 17)(51: 2)(51: 5)\) & (156:18) (156:20) & \((175: 14)(186: 22)\) & \((40: 8)(40: 11)(44: 22)\) \\
\hline \((57: 18)(58: 2)(58: 19)\) & emphasis (68:2) & (186:24) (187:8) & \((71: 13)(78: 8)(137: 18)\) \\
\hline \((59: 3)(59: 25)(60: 9)\) & empirical (261:4) & \((198: 12)(198: 15)\) & (153:13) (154:1) \\
\hline \((60: 10)(60: 12)(64: 11)\) & employ (218:14) & \((199: 10)(201: 8)\) & (176:4) (177:9) \\
\hline \((75: 23)(79: 20)(80: 18)\) & employed (26:5) & (204:7) (205:8) & \((177: 21)(178: 3)\) \\
\hline \((87: 1)(87: 2)(87: 3)\) & (286:10) (286:12) & (206:12) (206:23) & (191:24) (196:7) \\
\hline \((87: 6)(87: 10)(87: 14)\) & employee (195:3) & (207:9) (207:10) & (196:8) (205:10) \\
\hline \((87: 16)(87: 17)(87: 25)\) & (195:6) (202:4) (202:5) & \((209: 14)(218: 3)\) & (205:21) (206:14) \\
\hline \((88: 5)(88: 10)(88: 18)\) & (286:11) & \((218: 10)(228: 4)\) & (207:1) (241:3) \\
\hline \((88: 20)(88: 24)(90: 1)\) & employees (203:13) & \((237: 1)(237: 3)\) & (241:25) (272:18) \\
\hline \((93: 22)(94: 8)(94: 9)\) & (203:24) & \((237: 11)(237: 12)\) & (272:21) (273:25) \\
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\hline (106:13) (107:14) & enact (242:12) & (237:25) (238:1) & epa's (66:1)(83:11) \\
\hline \((116: 1)(126: 15)\) & enacting (243:4) & (238:11) (238:20) & (206:23) \\
\hline \((137: 21)(139: 22)\) & enclosed (46:13) & (240:5) (242:7) & epidemiologist \\
\hline \((139: 25)(143: 13)\) & (46:18) & (243:12) (251:6) & equalization (196:19) \\
\hline \((147: 1)(149: 3)\) & encompass (268:13) & (252:15) (252:21) & equalize (197:2) \\
\hline (149:10) (149:19) & end (10:20) (12:12) & (253:1) (253:5) & equation (59:12) \\
\hline \((150: 1)(150: 10)\) & (56:6) (162:14) & (253:23) (257:22) & (59:20) \\
\hline \((150: 13)(150: 15)\) & \((162: 22)(163: 5)\) & (258:2) (258:3) (259:5) & equipment (10:3) \\
\hline (153:12) (154:13) & \((190: 1)(190: 14)\) & (259:19) (261:6) & \((13: 3)(24: 25)(95: 8)\) \\
\hline \((154: 16)(156: 18)\) & \((213: 6)(231: 9)\) & (265:8) (267:3) (268:7) & \((95: 12)(106: 5)(106: 7)\) \\
\hline \((158: 8)(158: 12)\) & endanger (208:14) & (268:21) (270:9) & (128:9)(137:14) \\
\hline (158:16) (159:12) & ended (156:6) & \((274: 18)(275: 11)\) & (278:25) \\
\hline \((160: 9)(161: 24)\) & ends (46:14)(194:1) & (276:6) & equivalent (63:8) \\
\hline \((162: 2)(175: 20)\) & (194:20) & enforces (9:24) & (64:18)(167:12)
\[
(167: 14)(191: 15)
\] \\
\hline \((176: 8)(176: 10)\) & enforce (16:18) & (91:25) (235:16) & \[
\begin{aligned}
& (167: 14)(191: 15) \\
& \text { error }(137: 17)
\end{aligned}
\] \\
\hline \((176: 11)(176: 13)\) & (92:15) (182:3) (201:2) & (249:19)(283:17)
enforcing (24:19) & \[
\begin{array}{ll}
\text { error } & (137: 17) \\
\text { escape } & (45: 8)(194: 1)
\end{array}
\] \\
\hline \((176: 19)(176: 21)\) & (201:3) (201:4) (201:7) & \begin{tabular}{l}
enforcing (24:19) \\
engineer (86:14)
\end{tabular} & \[
\begin{aligned}
& \text { escape }(45: 8)(194: 1) \\
& (194: 10)
\end{aligned}\left(\begin{array}{l}
\text { ent }
\end{array}\right.
\] \\
\hline \((176: 24)(177: 1)\) & \((201: 9)(201: 10)\)
\((206: 20)(252: 22)\) & engineer (86:14)
\[
(151: 3)(151: 12)
\] & escaping (194:13) \\
\hline \((177: 6)(177: 10)\)
\((177: 12)(177: 13\) & \((206: 20)(252: 22)\)
\((253: 2)(284: 20)\) & \((151: 3)\)
\((151: 13)\)
\((151: 14)\) & escrow (216:17) \\
\hline \((177: 14)(178: 12)\) & enforceable (23:14) & (207:7) & (218:20) \\
\hline \((178: 16)(178: 22)\) & (24:2) (24:4) (206:16) & engineering (15:18) & especially (22:23) \\
\hline \((179: 12)(179: 17)\) & (206:25) & (105:15) (174:13) & (157:10) (224:4) (252:2) \\
\hline \((179: 25)(180: 3)\) & enforced (62:18) & \((174: 14)(175: 10)\) & esquire (1:17)(2:2)
\[
(2: 5)(2: 6)(2: 10)(2: 13)
\] \\
\hline (193:3) (193:4) (193:9) & (62:19) (165:11) & \[
(278: 11)(279: 6)
\] & \[
\begin{aligned}
& (2: 5)(2: 6)(2: 10)(2: 13) \\
& \text { essential } \quad(6: 20)(7: 3)
\end{aligned}
\] \\
\hline (193:18) (193:24) & enforcement (1:7) & &  \\
\hline \((193: 25)(194: 4)\) & \((4: 14)(4: 17)(4: 19)\) & ensure (10:10) &  \\
\hline \((194: 13)(194: 20)\) & \((7: 9)(9: 9)(10: 16)\) & (141:3) (224:4) & \[
\begin{aligned}
& (188: 22)(243: 23) \\
& (275: 18)
\end{aligned}
\] \\
\hline \((196: 20)(198: 2)\) & \((10: 18)(10: 21)(10: 23)\) & entail (15:4) & \\
\hline
\end{tabular}
\begin{tabular}{|c|c|c|c|}
\hline establish & & & fayette \\
\hline  &  &  &  \\
\hline
\end{tabular}
\begin{tabular}{|c|c|c|c|}
\hline \multicolumn{2}{|l|}{feasibility} & \multicolumn{2}{|r|}{gives} \\
\hline (144:13) (160:24) & \((44: 12)(56: 9)(61: 6)\) & (225:18) & (286:10) (286:11) \\
\hline feasibility (261:2) & \((74: 20)(76: 20)(77: 2)\) & forms (30:21)(36:3) & future (26:18)(29:2) \\
\hline feasible (12:8) & (111:16) (114:6) & \((72: 20)(73: 23)(229: 24)\) & (61:13)(82:17)(99) \\
\hline (259:21) (259:24) & (144:3) (188:8) &  & G \\
\hline feasibly (259:7) & (217:17) (224:10) & forty-three & gap (46:17)(193:22) \\
\hline february (162:19)
\((163: 3)(215: 25)\) & \[
\left\lvert\, \begin{array}{ll}
(233: 23) & (243: 23) \\
\text { finish } & (116: 14)
\end{array}\right.
\] & \[
\begin{aligned}
& \text { forward }(7: 20)(8: 19) \\
& (110: 16)(213: 8)
\end{aligned}
\] & \[
(221: 16)
\] \\
\hline \((163: 3)(215: 25)\)
\((216: 1)\) & \((116: 16)(129: 17)\) & found (223:17) & gas (38 \\
\hline federal (9:19) & (129:18) & foundation (233:15) & \((38: 7)(38: 8)(38: 10)\) \\
\hline \((11: 24)(12: 2)(12: 22)\) & finished (233:9) & (234:3) & \((38: 15)(40: 5)(40:\) \\
\hline (24:11) (24:17) (26:21) & (240:7) & foundation and & \((40: 8)(42: 3)(42: 20)\) \\
\hline (91:22) (92:1) (92:11) & finishing (231:6) & four (15:7) (63:3) & \((43: 9)(44: 21)(46: 9)\) \\
\hline (95:13) (113:17) & (233:1) & (79:5) (132:17) (175:3) & (57:12) (57:15) (57:20) \\
\hline \((135: 13)(136: 6)\) & fire (42:10)(42:24) & (178:5) (178:9) & \((57: 22)(57: 25)(58: 1)\) \\
\hline (136:9) (145:9) & fired (57:16) & (178:13) (178:14) & \((58: 15)(59: 2)(156: 19)\) \\
\hline \((145: 14)(153: 10)\) & five (17:11)(19:5) & (185:4) (187:2) (210:8) & \[
(168: 14)(179: 7)
\] \\
\hline (165:4) (165:5) (165:6) & \((31: 3)(51: 21)(53: 11)\) & (210:13) (211:16) & \[
(179: 22)(1
\] \\
\hline (186:21) (206:15) & (53:16) (65:19) (66:12) & (222:22) & (192:12) (192:15) \\
\hline (206:19) (235:4) & \((92: 7)(205: 3)(210: 15)\)
\((211: 16)(213: 19)\) & \[
\begin{aligned}
& \text { fourth }(98: 11) \\
& (98: 14)(103: 5)(167: 6)
\end{aligned}
\] & \[
\begin{aligned}
& (192: 20)(192: 22) \\
& (197: 18)(197: 21)
\end{aligned}
\] \\
\hline \((235: 16)(236: 12)\)
\((246: 17)(249: 8)\) & \((211: 16)(213: 19)\)
\((213: 20)(213: 25)\) & \((98: 14)(103: 5)(167: 6)\)
\((184: 12)(212: 6)\) & \[
(197: 24)(198: 9)
\] \\
\hline (250:11) (250:15) & \((236: 1)(236: 6)\) & (212:7) (212:23) & (201:18) (202:13) \\
\hline (260:13) (278:22) & (236:17) (237:8) & frame's (274:7) & (202:15) (202:17) \\
\hline (279:3) (279:12) & (274:9)(278:2) & frankly (31:3) & (202:24) (209:24) \\
\hline (283:2) (284:13) & five-month (49:12) & frequent (283:25) & (222:20) (223:2) \\
\hline (284:18) (284:25) & (129:1) & frequently (183:14 & (223:16) (224:2 \\
\hline federally (23:14) & five-step (273:18) & fresh (217:11) & \[
\begin{aligned}
& (225: 6)(225: 9) \\
& (227: 14)(270: 19)
\end{aligned}
\] \\
\hline (24:2) (24:4) (165:14) & \begin{tabular}{l}
fix (60:20) \\
flammable (225:9)
\end{tabular} & \[
\begin{aligned}
& \text { front } \quad(46: 7)(64: 23) \\
& (194: 1)(194: 11)
\end{aligned}
\] & \[
\begin{aligned}
& (227: 14)(270: 19) \\
& (270: 21)(270: 22)
\end{aligned}
\] \\
\hline \((206: 15)(206: 24)\)
\((206: 25)\) & flammable (225:9)
fleeting (252:1) & \[
\begin{aligned}
& (194: 1)(194: 11) \\
& (217: 11)(244: 19)
\end{aligned}
\] & \[
(270: 25)(271: 3)
\] \\
\hline feedback (32:13) & flexibility (54:24) & fuel (35:17) (38:12) & (282: 6) (283:11) \\
\hline feet (37:5)(202:15) & (161:19) & (200:21) (201:19) & (283:15) \\
\hline felt (62:20)(259:23) & flip (212:19) & (202:17) (220:15) & gaseous
\[
(45: 24)
\] \\
\hline (259:25) & floor (2:7) (202:24) & fuels (32:9) & \[
(46: 11)(57: 13)(1
\] \\
\hline fertility (223:7) & flow (56:5)(56:7) & fugitive (10:1)
\[
(28: 3)(30: 6)(30: 8)
\] & \[
\begin{array}{ll}
(193: 4) & (198: 4)(2) \\
\text { gases } & (30: 9)(38
\end{array}
\] \\
\hline (225:11) & fluctuating (166:17) & \[
(32: 14)(34: 5)(34: 16)
\] & \[
(41: 12)(45: 6)(45: 8)
\] \\
\hline \[
\begin{aligned}
& \text { few } \quad(8: 1)(55: 21) \\
& (66: 8)(66: 16)(79: 3)
\end{aligned}
\] & \[
\begin{array}{ll}
\text { focus } & (15: 21)(233: 17) \\
\text { folks } & (148: 2)
\end{array}
\] & \((32: 14)(34: 5)(34: 16)\)
\((34: 20)(35: 7)(36: 11)\) & \((192: 5)(192: 10)\)
\((192: 11)(197: 25)\) \\
\hline \((149: 6)(188: 18)\) & follow (9:12)(9:14) & \((44: 3)(44: 5)(52: 6)\) & (192:11) (197:25) \\
\hline (188:21) (197:10) & (9:22) (9:23) (10:7) & \((93: 22)(107: 14)\)
\((139: 21)(139: 25)\) & gasoline (35:19) gateway (2:7) \\
\hline (203:7) (216:21) & \((10: 10)(10: 14)(10: 15)\) & \[
\begin{aligned}
& (139: 21)(139: 25) \\
& (150: 10)(150: 12)
\end{aligned}
\] & \begin{tabular}{l}
gateway (2:7) \\
gather (182:22)
\end{tabular} \\
\hline (244:3) (247:4) (257:1) & \((10: 17)\)
\((140: 4)(146: 10)\) & \[
\begin{aligned}
& (150: 10)(150: 12) \\
& (150: 14)(154: 13)
\end{aligned}
\] & \begin{tabular}{l}
gather (182:22) \\
gave (7:18)(96:20)
\end{tabular} \\
\hline \((260: 2)(260: 8)(276: 22)\)
fewer (51:1) (51:5) & \((140: 4)(146: 10)\)
\((164: 7)(164: 8)(165: 8)\) & \((150: 14)(154: 13)\)
\((154: 16)(176: 20)\) & gave (7:18)(96:20)
\[
(161: 18)(184: 7)
\] \\
\hline (165:23) & \((165: 21)(166: 5)\) & \((176: 23)(177: 1)\) & (231:15) \\
\hline field (37:6) & \((166: 6)(189: 22)(250: 8)\) & \((177: 6)(177: 14)\) & gazette (111:3) \\
\hline fifth (184:13) & followed (141:4) & (199:14) (240:1) & gears (180:4)(249:7) \\
\hline (211:17) & (148:1) (148:21) & (253:14) (253:19) & \[
(262: 23)
\] \\
\hline fifty (33:16) & \[
(155: 15)
\] & \[
\begin{aligned}
& (253: 21)(268: 16) \\
& (268: 17)(280: 17)
\end{aligned}
\] & general (38:4)
\[
(155: 7)(207: 9)(208: 3)
\] \\
\hline figure (21:9)(259:6)
\((271: 2)\) & \begin{tabular}{l}
following (50:9) \\
(138:3) (138:13)
\end{tabular} & \[
\begin{aligned}
& (268: 17)(280: 17) \\
& (282: 4)(282: 5)
\end{aligned}
\] & \[
\begin{aligned}
& (155: 7)(207: 9)(208: 3) \\
& (253: 8)(276: 21)
\end{aligned}
\] \\
\hline figured (116:7) & \((141: 7)(149: 14)\) & fugitives (34:21) & generally (137:4) \\
\hline figuring (197:10) & \((196: 15)(199: 19)\) & \((35: 5)(35: 9)(35: 11)\) & (178:18) (192:5) \\
\hline file (182:23) (227:3) & \((222: 10)(223: 12)\) & \((177: 20)(179: 13)\) & (231:10) (281:11) \\
\hline filed (7:8)(117:13) & (223:16) (247:16) & (254:15) (269:2) (280:9 & generated (260:23) \\
\hline fill (40:13) & follows (14:2) & full (14:5) (22:16) & \[
\begin{aligned}
& \text { genetic (223:5) } \\
& (225: 10)
\end{aligned}
\] \\
\hline filled (247:5) & (173:18) & \[
\begin{aligned}
& (124: 17)(173: 21) \\
& (183: 7)(183: 8)
\end{aligned}
\] & \[
\begin{array}{ll}
(225: 10) \\
\text { georgia } & (14: 23)
\end{array}
\] \\
\hline filters (192:14)
final (127:16) & \[
\begin{aligned}
& \text { food }(6: 17) \\
& \text { football (37:6) }
\end{aligned}
\] & \[
\begin{aligned}
& (183: 7)(183: 8) \\
& (187: 15)(196: 7)
\end{aligned}
\] & georgia (14:23)
\[
(15: 3)(15: 5)(15: 8)
\] \\
\hline \[
\left\lvert\, \begin{array}{ll}
\text { final } & (127: 16) \\
(192: 1) & (216: 11)
\end{array}\right.
\] & football (37:6)
for gases (192:9) & \[
(210: 25)(219: 14)
\] & \[
(15: 22)(64: 7)(161: 5)
\] \\
\hline (231:4) (231:7) (243:1) & force (175:4)(202:22) & (239:13) (247:5) & \[
\text { germ }(223: 4)(223: 15)
\] \\
\hline (258:12) (275:4) & \begin{tabular}{l}
forgot (29:10) \\
(90:22) (122:14)
\end{tabular} & \[
\begin{aligned}
& (272: 10) \\
& \text { fully } \quad(46: 13)(46: 17)
\end{aligned}
\] & \[
\begin{aligned}
& (223: 17)(224: 18) \\
& \text { gets } \quad(49: 20)(110: 1)
\end{aligned}
\] \\
\hline \begin{tabular}{l}
finalized (71:13) \\
financially (286:
\end{tabular} & \[
\begin{aligned}
& (90: 22)(122: 14) \\
& \text { form }(35: 16)(35: 19)
\end{aligned}
\] & \[
\operatorname{fully}_{(115: 6)}(46: 13)(46: 17)
\] & \[
(192: 22)(198: 8)(249: 2)
\] \\
\hline find (23:1) (30:19) & \((36: 9)(42: 19)(66: 21)\) & functioning (140:22) & gimme (49:21) \\
\hline (189:14) (189:16) & (66:22) (74:12) (79:14) & fundamentally (59:14) & given (9:2)(14:7) \\
\hline \((189: 21)(200: 10)\) & formal (15:24)(71:1) & further (15:23) & (112:11) (165:20) \\
\hline finds (207:13) & (174:15) & (51:4) (69:8) (90:3) & \[
(166: 23)(171: 4)
\] \\
\hline (208:4) (209:2) & formally (70:16) & (172:25) (173:7) & (181:6) (233:5) (246:7) \\
\hline \[
\text { fine }(17: 6)(18: 20)
\] & formed (66:2) & \[
\begin{aligned}
& (174: 22)(282: 10) \\
& (285: 5)(285: 6)
\end{aligned}
\] & \[
\begin{aligned}
& (286: 9) \\
& \text { gives } \quad(26: 7)(28: 11)
\end{aligned}
\] \\
\hline
\end{tabular}

\section*{giving}
idea

\begin{tabular}{|c|c|c|c|}
\hline ideal (11:13) & \((8: 12)(48: 4)(48: 22)\) & (278:24) & (110:8) \\
\hline identification & (157:16) & incomplete (233:9) & inquiry (112:3) \\
\hline identified (44:22) & impossible (160:22) & (234:4) & (112:20) \\
\hline (46:24) (90:11) & (177:7) (256:3) & inconsisten & nside (141:20) \\
\hline \((132: 22)(133: 1)\) & improve (29:21) & incorporate (18:15) & inspect (63:16) \\
\hline (133:3) (240:4) & \((30: 1)(51: 22)(54: 17)\) & (201:11) & ) \\
\hline (241:17) (243:12) & (119:4) (121:16) & incorporated (23:5) & (284:18) \\
\hline identifies (19:16) & \((121: 19)(122: 9)\) & incorporating (15:6) & inspected (105:25) \\
\hline identify (5:6)(71:7) & \((159: 6)(159: 8)(170: 3)\) & incorporation (24:4) & inspecting (63 \\
\hline (71:21) (131:16) & (202:7) (209:20) & incorrect (148:17) & (63:14) (250:3) (283:22) \\
\hline (223:3) (252:5) & \((227: 18)(249: 3)\) & (157:13) & in \\
\hline idle (11:3) (11:17) & (269:3) (275:8) & incorrectly (115:18) & (61:22) (64:4) (134:25) \\
\hline \((12: 17)(12: 19)(109: 4)\) & improved (169:21 & increase (48:13) & \((136: 8)(138: 17)\) \\
\hline (134:9) (152:4) & \((169: 22)(169: 23)\) & (68:15) (77:4) (77:6) & (141:3) (14 \\
\hline (152:14) (152:18) & (178:3) (203:12) & \((77: 8)(98: 25)(101: 3)\) & (1 \\
\hline (161:17) (162:4) & improvement (51:19) & \((101: 5)(105: 1)(159: 7)\) & (189:8) (250:11) \\
\hline \((162: 8)(170: 22)\) & \((51: 20)(51: 21)(54: 13)\) & (204:8) (243:17) (248:8) & inspections (9: \\
\hline \((200: 16)(205: 1)\) & \((54: 14)(60: 15)(60: 17)\) & increased (59:3) & (52:9) (52:10) (52: \\
\hline (205:2) (220:6) & \((122: 5)(156: 3)(157: 9)\) & (99:17)(144:13) & (52:15) (52 \\
\hline (220:13) (220:20) & \((158: 15)(158: 19)\) & (203:24) & (52:19) \\
\hline (220:22) (221:6) & \((158: 21)(158: 25)\) & increasing (47:20) & (105:20) (135:7) \\
\hline (221:17) (221:22) & \((170: 6)(171: 23)\) & (77:6) (245:3) (274:12) & (139:16) (140:15) \\
\hline (255:16) (256:8) & \((199: 11)(199: 16)\) & indeed (249:24) & (140:17) (140:20) \\
\hline (261:17) (269:15) & \((199: 17)(200: 9)\) & indefensible (65:2 & \((140: 24)(158: 9)\) \\
\hline (269:18) (275:16) & (202:2) (202:9) & indent (247:5) & (158:10) (158:11) \\
\hline (275:22) (275:23) & (202:23) (255:17) & indented (246:24) & \((158: 12)(170: 6)\) \\
\hline \((275: 24)(276: 3)\) & (255:18) (255:19) & indevo (224:14) & (171:4) (171:10) \\
\hline (276:10) & (255:21) (255:23) & index (3:1)(4:1) & (171:21) (172:1 \\
\hline idled (163:8) & (261:21) (268:10) & indicated (26:1) & (2 \\
\hline (163:17) (163:22) & \((276: 17)(276: 20)\) & (179:11) (184:3) & (277:22) (281:18) \\
\hline \((163: 24)(221: 9)\) & (276:22) & (214:18) (272:19) & inspector (252:23) \\
\hline \((221: 25)(256: 18)\) & improvements (77:7) & indicates (177:13) & inspectors (10 \\
\hline idling (11:5)(11:8) & \((122: 23)(158: 1)\) & indicating (13:6) & \[
(10: 6)(10: 10)
\] \\
\hline \((53: 24)(150: 22)\) & \((192: 2)(203: 10)\) & indication (261:20) &  \\
\hline (151:5) (151:15) & improves (170:17) & indicator (58:6) & (63:23) (135:6) \\
\hline \((151: 20)(161: 16)\) & improving (30:20) & individual (10:4) & \[
\begin{aligned}
& (136: 11)(138: 2) \\
& (138: 6)(138: 8)
\end{aligned}
\] \\
\hline \((162: 24)(163: 4)\) & \((60: 23)(170: 5)\)
\((203 \cdot 14)(238: 16)\) & \[
\begin{aligned}
& (37: 7)(58: 10) \\
& \text { induce } \quad(223: 20)
\end{aligned}
\] & \[
\begin{aligned}
& (138: 6)(138: 8) \\
& (138: 10)(138: 18)
\end{aligned}
\] \\
\hline (200:11) (200:17) & \((203: 14)(238: 16)\)
\((269: 6)(269: 17)\) & \[
\begin{array}{ll}
\text { induce } & (223: 20) \\
(224: 13) & (224: 15)
\end{array}
\] & \[
(139: 7)(139: 10)
\] \\
\hline \[
\begin{aligned}
& (200: 18)(209: 19) \\
& (209: 22)(210: 2)
\end{aligned}
\] & \[
\begin{aligned}
& (269: 6)(269: 17) \\
& \text { inappropriate }
\end{aligned}
\] & \[
\begin{aligned}
& (224: 13)(224: 15) \\
& \text { industrial (84:4) }
\end{aligned}
\] & \[
(139: 21)(139: 24)
\] \\
\hline (209:22)
ignore (179:1) & inappropriate
inches
\((37: 7)\) & \((84: 8)(84: 10)(160: 2)\) & (140:4) (140:5) (140:9 \\
\hline \((217: 7)(217: 8)\) & include (28:1) & industry (20:1) & (153:2) (193:12) \\
\hline image (84:25) & (91:19)(91:22) (112:1) & (26:24) (38:10) (73:22) & \((193: 21)(250: 2)\)
\((250: 8)(252: 12)\) \\
\hline immaterial (112:14) & \((124: 22)(165: 14)\) & (99:8)(99:12) (143:4) & \[
\begin{aligned}
& (250: 8)(252: 12) \\
& (283: 21)(284: 17)
\end{aligned}
\] \\
\hline immediate (207:20) & \((175: 23)(196: 13)\) & \begin{tabular}{l}
infer (83:7) \\
influence (157:21)
\end{tabular} & \[
\begin{array}{ll}
(283: 21) & (284: 17) \\
\text { install } & (53: 19)
\end{array}
\] \\
\hline (208:18) (209:15) & \((198: 16)(236: 12)\) & influence (157:21) &  \\
\hline (272:10) & \((237: 22)(253: 14)\) & influenced (243:19) & \[
(195: 10)(195: 14)
\] \\
\hline immediately (274:20) & (253:21) (262:16) & \begin{tabular}{l}
informal (70:1)(70:6) \\
informally (70:4)
\end{tabular} & \[
\begin{aligned}
& (195: 10)(195: 14) \\
& (196: 15)(197: 4)
\end{aligned}
\] \\
\hline (281:5) \({ }^{\text {(24.22) }}\) & \((268: 14)(271: 25)\)
\((272: 1)(280: 24)\) & \begin{tabular}{l}
informally (70:4) \\
information (72:13)
\end{tabular} & \[
\begin{array}{|l}
(196: 15)(197: 4) \\
\text { installed (196:3) }
\end{array}
\] \\
\hline \[
\begin{array}{|l}
\text { impact } \\
(74: 24) \\
(86: 12)
\end{array}
\] & \((272: 1)(280: 24)\)
\((280: 25)\) & information (72:13)
\[
(111: 9)(112: 15)
\] & \[
(196: 24)(197: 4)
\] \\
\hline \((74: 24)(86: 12)\)
\((134: 17)(143: 14)\) & included (87:17) & \((121: 5)(132: 6)\) & instance (67:17) \\
\hline \((145: 13)(148: 7)\) & (112:13) (215:10) & \((180: 19)(186: 21)\) & (67:18) (167:2) \\
\hline \((151: 23)(152: 2)\) & \((216: 24)(233: 18)\) & (201:4) (207:14) & instances (73:9) \\
\hline \((152: 16)(229: 10)\) & \((238: 10)(249: 23)\) & (208:5) (208:25) & (102:23) \\
\hline \((247: 20)(247: 25)\) & \((268: 22)(281: 8)\) & (209:1) (209:3) (217:9) & instead (27:24) \\
\hline (254:1) (254:9) (255:5) & includes (10:24) & \((222: 25)(223: 17)\)
\((224: 3)(233: 16)\) & \[
\begin{aligned}
& \text { (190:4)(191:8) } \\
& \text { instituted (8:1) }
\end{aligned}
\] \\
\hline (255:13) (255:24) & (11:2) (40:9) (92:23) & (224:3) (233:16) & insufficient (149:15) \\
\hline impacted (77:18) & \((93: 1)(93: 21)(107: 5)\) & (241:2) (246:3)(276:1) & insufficient (149:15) \\
\hline (233:22) & \((107: 18)(107: 22)\) & infrastructure & \\
\hline impacting (255:1) & (108:2) (110:5) (176:4) & \begin{tabular}{l}
inhaled (225:12) \\
initial (183:9)
\end{tabular} & \[
\begin{aligned}
& \text { intended (46:21) } \\
& (46: 23)(195: 23)
\end{aligned}
\] \\
\hline impacts (86:17)
\((86: 23)(148: 15)\) & \((176: 7)(206: 14)\)
\((206: 24)(218: 12)\) & \[
\begin{array}{ll}
\text { initial } & (183: 9) \\
\text { initiate } & \text { (39:17) }
\end{array}
\] & \[
\begin{array}{ll}
(46: 23) & (195: 23) \\
\text { intent } & (188: 12)
\end{array}
\] \\
\hline \((86: 23)(148: 15)\)
\((152: 6)(254: 6)\) & \((206: 24)\)
\((237: 23)\)
\((241: 10)\) & initiated (48:9) & (188:17) (193:17) \\
\hline implementation & (242:9) (267:12) & (53:7) & (199:13) (199:15) \\
\hline importance (59:20) & (282:19) & initiative (166:19) & (220:4) (220:7) \\
\hline important (57:4) & including (45:2) & input (172:21) & (220:19) (221:3) \\
\hline \((59: 18)(108: 16)\) & (61:22) (111:23) & inputs (86:10) & \((221: 5)(257: 10)\)
\((261: 15)(261: 18)\) \\
\hline \((108: 18)(135: 10)\) & (111:24) (125:4) & \((147: 11)(147: 17)\) & (261:15) (261:18) \\
\hline impose (54:18) & \((132: 14)(207: 16)\) & \begin{tabular}{l}
inquires (111:7) \\
inquiries (110:2)
\end{tabular} & \[
\begin{aligned}
& (262: 10)(268: 12) \\
& \text { intention } \quad(195: 15)
\end{aligned}
\] \\
\hline
\end{tabular}
\begin{tabular}{|c|c|c|c|}
\hline \multicolumn{2}{|l|}{intentions} & \multicolumn{2}{|r|}{leaks} \\
\hline intentions (195:13) & irrespective (112:12) & \begin{tabular}{l}
\[
\text { j-u } \quad(230: 21)
\] \\
judge (263:11)
\end{tabular} & L \\
\hline \begin{tabular}{l}
interest (202:10) \\
interested (175:22)
\end{tabular} & \[
(225: 15)
\] & \[
(263: 12)
\] & label (124:10) \\
\hline (286:12) & irvin (185:1) & judgment (56:12) & (132:22) \\
\hline interesting (24:20) & isis (83:12) & \((56: 25)(60: 25)(61: 4)\) & labeled (119:1 \\
\hline \((25: 8)(25: 16)(49: 10)\) & issuance (204:6) & \[
(69: 6)(69: 22)(69: 24)
\] & (219:12) \\
\hline \((49: 16)(100: 13)\) & \((207: 21)\) & (70:6) (70:15) (70:22)
\[
(117: 24)(118: 6)
\] & \[
(231: 25)
\] \\
\hline \(\begin{array}{ll}(167: 15) & (167: 18) \\ \text { intern } & (233: 10)\end{array}\) & issue (6:3)(7:2)
\((8: 2)(8: 18)(9: 25)\) & \((117: 24)(118: 6)\)
\((122: 17)(122: 24)\) & \[
\operatorname{lag} \quad(71: 12)
\] \\
\hline \(\begin{array}{ll}\text { intern } \\ \text { internal } & (111: 20)\end{array}\) & \((42: 15)(44: 13)(46: 20)\) & (123:3) (125:15) & landfills (247:1) \\
\hline (111:22) & \((47: 23)(72: 18)(72: 21)\) & (125:17) (169:19) & language (213:13) \\
\hline interns (230:16) & \((98: 1)(98: 10)(98: 16)\) & \[
\begin{aligned}
& (198: 14)(198: 25) \\
& (211: 11)(211: 14)
\end{aligned}
\] & large (29:19)(42:17)
\[
(45: 2)(84: 9)(85: 5)
\] \\
\hline internship (231:9) & \((99: 21)(100: 9)\)
\((101: 25)(102: 11)\) & \[
\begin{aligned}
& (211: 11)(211: 14) \\
& (211: 24)(212: 9)
\end{aligned}
\] & \[
(85: 6)(95: 1)(115: 4)
\] \\
\hline interpretation & \((101: 25)\)
\((107: 14)(122: 16)\) & \[
(212: 15)(213: 15)
\] & \[
(168: 25)(183: 18)
\] \\
\hline interrupt (28:19) & \((125: 7)(146: 23)\) & \((239: 20)(240: 2)\) & \((185: 9)(265: 5)\) \\
\hline (223:23) & (188:2) (198:12) & (247:12) (247:17) & larger (104:22) \\
\hline interstate (208:12) & (237:10) (237:14) & (256:22) (262:24) & largest (74:23)(85 \\
\hline interview (245:19) & \((269: 25)(270: 3)\) & (263:3) (263:5) & last (11:7)(1 \\
\hline (246:7) (247:8) & (270:4) (270:15) & (263:18) (263:22) & \[
(99: 20)(170: 20)
\] \\
\hline introduce (42:2) & \[
(270: 20)
\] & \((263: 25)(264: 8)\)
\((267: 5)(267: 16)\) & \[
(172: 14)(188: 2)
\] \\
\hline introduced (228:1) & \((16: 17)(48: 20)(62: 17)\) & \((267: 23)(268: 1)(269: 7)\) & (188:15) (188:24) \\
\hline introducing (79:1) & \((109: 6)(110: 23)\) & julie (230:19) & (188:25) (189:4) \\
\hline inventories (149:3) & (114:18) (114:24) & (230:20) (230:22) & \[
\begin{array}{|l}
(189: 9)(189: 16) \\
(189: 19)(189: 20)
\end{array}
\] \\
\hline \((159: 14)(176: 11)\) & \((115: 20)(123: 8)\) & \[
\text { july } \quad(167: 2)(167: 3)
\] & (189:19) (189:20)
\[
(189: 21)(189: 23)
\] \\
\hline \((279: 22)(280: 1)\) & \((123: 12)(123: 20)\)
\((183: 25)(186: 1)\) & \[
(212: 12)(221: 13)
\] & \[
(190: 2)(190: 9)(191: 8
\] \\
\hline (280:15)
inventory & \((183: 25)(186: 1)\)
\((186: 19)(191: 17)\) & jump (175:18) & (230:21) (276:22) \\
\hline (28:16) (28:23) (29:14) & (195:9) (207:17) & june (7:8)(9:8) & (277:1) \\
\hline \((29: 18)(30: 16)(30: 23)\) & (212:21) (236:8) & (48:18) (124:13) & late (202:11) \\
\hline \((31: 5)(31: 10)(31: 18)\) & (239:2) (257:23) & (212:3) (212:21) & later (232:24) \\
\hline \((87: 2)(87: 4)(87: 10)\) & (258:2) (258:4) & (218:4) (221:2) & \[
\begin{aligned}
& \operatorname{law} \quad(9: 12)(9: 23) \\
& (10: 15)(10: 17)(164: 7)
\end{aligned}
\] \\
\hline \((87: 25)(88: 5)(88: 20)\) & issues (7:21) (7:24) & (221:12) (228:4) (258:2) & \[
\begin{aligned}
& (10: 15)(10: 17)(164: 7) \\
& (164: 9)
\end{aligned}
\] \\
\hline \((88: 24)(149: 10)\) & \((20: 17)(44: 6)(44: 7)\) & jurisdiction (22:11)
\[
(113: 14)(113: 18)
\] & \[
\begin{aligned}
& (164: 9) \\
& \text { lawful (13:9) }
\end{aligned}
\] \\
\hline \((149: 17)(149: 19)\)
\((176: 10)(176: 14)\) & \((44: 14)(47: 5)(55: 7)\)
\((55: 8)(120: 25)(132: 5)\) & \[
\begin{array}{|ll}
(113: 14) & (113: 18) \\
\text { justify } & (281: 10)
\end{array}
\] & lawrenceville (72: \\
\hline \((176: 10)(176: 14)\) & \[
\begin{aligned}
& (55: 8)(120: 25)(132: 5) \\
& (183: 10)(232: 9)
\end{aligned}
\] & justify (281:10) & \begin{tabular}{l}
lead \\
(17:8)
\end{tabular} \\
\hline \((177: 13)(178: 16)\) & \[
(252: 12)
\] & K & leak (11:17)(12:13) \\
\hline (201:1) (201:3) (201:6) & issuing (182:16) & karamida (52:16) & \((40: 4)(43: 8)(46: 5)\) \\
\hline (201:7) (225:23) & item (166:7)(166:8) & (63:12) (63:13)(138:8) & (49:1) (53:14) (55:7) \\
\hline \((225: 24)(226: 1)\) & items (275:8) & (139:11) (139:13) & \[
(88: 19)(89: 7)(89: 8)
\] \\
\hline (226:5) (226:7) (254:9) & iterations (29:5) & \[
\begin{aligned}
& (140: 4)(158: 13) \\
& (250: 6)(250: 14)
\end{aligned}
\] & \((89: 10)(89: 12)(89: 17)\)
\((89: 22)(93: 12)(93: 15)\) \\
\hline \((271: 24)(272: 1)\)
\((279: 21)(280: 3)\) & i've (64:5)(79:4)
\((121: 4)(131: 21)\) & \[
\begin{aligned}
& (250: 6)(250: 14) \\
& (284: 16)(284: 17)
\end{aligned}
\] & \[
(126: 7)(127: 19)
\] \\
\hline \((279: 21)(280: 3)\)
\((280: 4)(280: 12)\) & \((121: 4)(131: 21)\)
\((174: 17)(181: 8)\) & karamida's (139:15) & \((127: 22)(128: 12)\) \\
\hline (280:19) (280:21) & \((207: 12)(245: 20)\) & karen (67:1) & \((128: 15)(128: 21)\) \\
\hline investigate (253:3) & \(J\) & \[
\begin{array}{ll}
\text { keeps } & (50: 1) \\
\text { kelly } & (3: 3)
\end{array}
\] & \[
\begin{aligned}
& (129: 6)(130: 11) \\
& (132: 17)(133: 13)
\end{aligned}
\] \\
\hline investigations & james (3:3)(14:1) & \((14: 1)(14: 5)(14: 7)\) & \((134: 7)(134: 18)\) \\
\hline invitro (224:14) & \((14: 7)(85: 17)(220: 2)\) & \((39: 13)(39: 16)(39: 19)\) & (161:13) (161:15) \\
\hline involve (9:16) & january (14:14) & \((39: 22)(39: 25)(44: 11)\) & \((168: 4)(178: 23)\) \\
\hline (55:10) (203:13) & (48:16) (56:24) (65:9) & \((58: 13)(69: 14)(90: 6)\) & (179:4) (188:22) \\
\hline involved (9:6)(12:6) & \((66: 21)(66: 22)(97: 23)\) & (91:16) (106:14) & \[
(242: 5)(243: 8)(257: 9)
\] \\
\hline \((25: 18)(60: 24)(102: 5)\) & \((103: 25)(180: 7)\) & \((106: 17)(112: 22)\)
\((114: 3)(115: 8)\) & \[
\begin{aligned}
& (258: 15)(260: 13) \\
& (260: 22)(261: 5)
\end{aligned}
\] \\
\hline \((120: 24)(127: 15)\) & (211:18) (222:3) & \[
\begin{aligned}
& (114: 3)(115: 8) \\
& (116: 15)(116: 17)
\end{aligned}
\] & \[
\begin{aligned}
& (260: 22)(261: 5) \\
& (262: 3)(262: 14)
\end{aligned}
\] \\
\hline \((156: 1)(157: 6)\)
\((174: 20)(188: 10)\) & \(\begin{array}{ll}\text { jason } & (2: 2)(5: 8) \\ \text { jayme } & (3: 6)(85: 25)\end{array}\) & \[
\begin{aligned}
& (116: 15)(116: 17) \\
& (119: 20)(119: 23)
\end{aligned}
\] & \[
\begin{aligned}
& (262: 3)(262: 14) \\
& (270: 18)(271: 5)
\end{aligned}
\] \\
\hline \((174: 20)(188: 10)\)
\((205: 13)(206: 3)\) & jayme \((3: 6)(85: 25)\)
\((173: 15)(173: 16)\) & \[
(119: 25)(129: 18)
\] & (280:21) \\
\hline (221:4) (233:7) & (173:23) & \((129: 20)(131: 20)\) & leaking (40:4)(40:8) \\
\hline (233:11) (245:13) & j-a-Y-m-e (173:25) & (141:23) (155:3) & (46:3) (46:7) (59:1) \\
\hline \((262: 24)(263: 1)\) & jeff (65:25) (66:6) & (173:4) (173:5) (174:1) & \[
(178: 10)(188: 14)
\] \\
\hline (263:2) (264:10) & (66:13) (96:4) & \((179: 11)(181: 8)\)
\((235: 22)\) & \[
(190: 3)(194: 3)(257: 17)
\] \\
\hline involvement (234:5) & jim (13:24)(85:17) & (235:22)
kept (203:4) & \[
\text { leaks }(11: 25)(12: 16)
\] \\
\hline \[
\begin{aligned}
& \text { involves (137:16) } \\
& (243: 5)
\end{aligned}
\] & \[
\begin{aligned}
& \text { jinghui } \quad(4: 24) \\
& \text { j-i-n-g-h-u-i }
\end{aligned}
\] & \begin{tabular}{lr} 
kept & \((203: 4)\) \\
kinds & \((200: 24)\)
\end{tabular} & \[
(12: 19)(13: 5)(30: 9)
\] \\
\hline involving (56:14) & job (15:4)(30:11) & knock (274:13) & \[
(30: 13)(32: 15)(34: 17)
\] \\
\hline (205:8) & (202:6) & \begin{tabular}{l}
knowledge (16:5) \\
\((52.25)(53.8)(122 \cdot 11)\)
\end{tabular} & \[
\begin{aligned}
& (49: 13)(49: 18)(50: 16) \\
& (50: 17)(50: 20)(50: 23)
\end{aligned}
\] \\
\hline iron (38:17)(38:19) & jobs (11:1)(152:6) & \[
\begin{aligned}
& (52: 25)(53: 8)(122: 11) \\
& (192: 24)(262: 10)
\end{aligned}
\] & \[
(53: 12)(53: 13)(58: 8)
\] \\
\hline \[
\begin{aligned}
& (39: 9) \\
& \text { irrelevant } \quad(233: 15)
\end{aligned}
\] & \[
\begin{aligned}
& \text { joint } \quad(4: 3)(13: 19) \\
& (13: 22)(90: 18)(90: 23)
\end{aligned}
\] & \[
\begin{aligned}
& (192: 24)(262: 10) \\
& \text { known }(72: 16)
\end{aligned}
\] & \[
\begin{aligned}
& (53: 12)(53: 13)(58: 8) \\
& (59: 10)(59: 23)(63: 3)
\end{aligned}
\] \\
\hline
\end{tabular}
\begin{tabular}{|c|c|c|c|}
\hline \multicolumn{3}{|l|}{learning} & matter \\
\hline \((63: 6)(63: 7)(88: 5)\) & limit (28:4)(161:15) & \((74: 7)(74: 11)(87: 11)\) & (200:22)(209:21) \\
\hline \((88: 9)(88: 16)(89: 25)\) & \((162: 20)(181: 10)\) & \((87: 12)(91: 2)(124: 3)\) & \((231: 7)(268: 1)(268\) \\
\hline \((130: 5)(133: 21)\) & \((181: 13)(181: 14)\) & (124:4) (164:8) & (280:18) \\
\hline \((166: 3)(166: 13)\) & (181:15) (181:19) & \((182: 15)(182: 25)\) & manage (56:5) \\
\hline \((167: 5)(167: 13)\) & (181:22) (202:14) & \((185: 16)(190: 12)\) & manager (15:1) \\
\hline (167:16) (167:22) & (203:3) (254:25) & (197:7) (269:1) (269:1 & managers (202:25) \\
\hline \((168: 1)(168: 2)(168: 4)\) & (255:10) (270:5) & losing (11:1) &  \\
\hline \((170: 21)(178: 14)\) & (272:11) & \[
\begin{array}{|lc}
\text { loss } & (11: 10) \\
\text { lot } & (10: 9)(18: 2)
\end{array}
\] & \[
\begin{aligned}
& \operatorname{manual}(38: 23) \\
& (49: 19)(49: 24)(49: 25
\end{aligned}
\] \\
\hline \((178: 15)(197: 15)\)
\((200: 24)(209: 6)\) & limitation (182:11)
(208:17) & \[
\left\lvert\, \begin{aligned}
& \text { lot }(10: 9)(18: 2) \\
& (18: 9)(22: 13)(22: 19)
\end{aligned}\right.
\] & \[
(50: 9)(50: 10)(50: 11)
\] \\
\hline (241:16) (260:20) & limited (132:15) & \((25: 17)(25: 19)(30: 4)\) & (50:13) (146:7) (146:9) \\
\hline (260:25) (262:20) & limits (28:2)(28:7) & \((32: 7)(37: 19)(37: 22)\) & (146:13) (146:15) \\
\hline \((270: 14)(270: 24)\) & \((50: 20)(114: 20)\) & \((39: 5)(39: 11)(40: 2)\) & (164:3) (164:6) \\
\hline \((271: 8)(271: 9)(272: 5)\) & \((115: 10)(147: 1)\) & (44:14) (45:19) ( \(49: 6)\) & (164:11) (164:12) \\
\hline (283:19) (283:22) & \((187: 23)(254: 18)\) & (59:19) (66:18) \((67: 21)\) & (164:19) (165:2) \\
\hline learning (80:25) & (254:21) (255:7) & \((72: 19)(73: 3)(74: 18)\) & \[
(165: 4)(165: 14)
\] \\
\hline least (6:6)(6:12) & (271:8) (271:20) & \((76: 13)(82: 4)(115\)
\((115: 3)(149: 5)\) & \[
(165: 20)(165: 21
\]
\[
(166: 22)(187: 6)
\] \\
\hline \((6: 22)(7: 5)(9: 2)\) & \((273: 5)(273: 10)\)
\((283: 3)(283: 5)(283: 6)\) & \((115: 3)(149: 5)\)
\((150: 10)(156: 3)\) & \[
(187: 12)(187: 18)
\] \\
\hline \((27: 20)(146: 14)\)
\((185: 25)(189: 12)\) & \((283: 3)(283: 5)(283: 6)\)
line (26:15)(85:12) & \((150: 10)(156: 3)\)
\((160: 4)(160: 17)\) & \((187: 19)(187: 21)\) \\
\hline (197:24) (204:9) & \((197: 12)(200: 6)\) & \((160: 23)(160: 25)\) & (187:24) (188:5) \\
\hline (276:25) (279:2) & (209:24) (220:14) & \((161: 10)(161: 18)\) & (189:7) (189:13) \\
\hline leave (8:16) & \((228: 24)(244: 23)\) & \((171: 22)(175: 24)\) & (190:8) (190:14) \\
\hline leaving (197:13) & (260:11) (261:12) & (180:1) (192:7) & (190:16) (190:20) \\
\hline (198:10) & 1iquid (192:21) & (200:12) (201:25 & \((190: 21)(191: 2)\) \\
\hline led (263:3) & list (76:24) & (224:2) (224:3) & (191:10) (228:16) \\
\hline left (37:23)(41:14) & listed (40:6)(40:11) & \[
(231: 11)(232: 12)
\] & \begin{tabular}{l}
manufacturer's \\
many \((11: 25)(13: 4)\)
\end{tabular} \\
\hline (41:17) (79:1) (82:14) & \((226: 24)(237: 7)\)
\((241: 18)(263: 18)\) & \[
\begin{aligned}
& (235: 19)(243: 18) \\
& (257: 17)
\end{aligned}
\] & many
\((41: 21)(59: 10)(64: 5)\) \\
\hline (121:24) (240:23) & \((241: 18)(263: 18)\)
\((268: 17)\) & \[
\begin{aligned}
& (257: 17) \\
& \text { lots }(32: 15)(1
\end{aligned}
\] & \((41: 21)(59: 12)(64: 5)\)
\((85: 8)(85: 12)(86: 15)\) \\
\hline (112:9) (112:11) & lists (236:22) & lousy (177:24) & \((88: 16)(88: 19)(167: 5)\) \\
\hline (112:13) (112:15) & litigation (117:21) & low (49:14)(220:10) & \((171: 5)(176: 11)\) \\
\hline \((112: 16)(112: 20)\) & little (6:10)(18:24) & Iower (9:5) (170:7) & \((177: 7)(178: 4)\) \\
\hline (113:8) (113:11) & (22:19) (25:16) (38:21) & (203:2) (220:11) & (179:17) (184:18) \\
\hline (117:21) & \((47: 17)(56: 8)(58: 3)\) & (227:14) (254:24) & (191:5) (201:17) \\
\hline length (37:6)(193:17) & \((59: 5)(62: 1)(93: 3)\) & (255:1) (255:4) (255:9) & (205:6) (205:12) (270:7) \\
\hline less (51:2)(67:24) & (106:19) (117:22) & lowest (161:1) & map (4:11)(84:13) \\
\hline (133:21) (180:1) & (126:10) (134:24) & lunch (173:9) & (84:15) (141:14) \\
\hline \((190: 17)(255: 1)\) & \((134: 25)(137: 1)\) & lungs (20:15)(223:9) & \begin{tabular}{l}
(141:18) (141:20) \\
(142:5) (142:8)
\end{tabular} \\
\hline (255:5) (255:15) & (145:6) (161:21) & \[
(225: 16)
\] &  \\
\hline letter (93:13) & \((174: 20)(178: 8)\) & lynn (14:7) & \[
(211: 23)(220: 18)
\] \\
\hline (211:2) (211:4) (218:3) & \((191: 4)(227: 16)\)
\((230: 2)(235: 22)\) & M & (221:25) (239:20) \\
\hline (220:18) (221:4) (278:7) & (246:11) (249:7) & machine (192:17) & (286:19) \\
\hline level (20:16) (36:4) & (252:21) (263:19) & made (11:18) (123:8) & mark (2:5)(5:12) \\
\hline (36:9) (36:12) (179:7) & (265:15) (269:22) & (134:3) (148:1) (163:4) & (84:14) (90:18) (90: \\
\hline (269:2) & (276:24) & (234:9) (280:19) & \begin{tabular}{l}
(91:5) (206:16) \\
(217:20) (219:1)
\end{tabular} \\
\hline levels (6:25)(79:11) & \(\begin{array}{ll}l i v e & (233: 23) \\ \text { liver } & (225: 16)\end{array}\) & \begin{tabular}{l}
main (51:13)(185:4) \\
maintain (16:4)
\end{tabular} & \begin{tabular}{ll}
\((217: 20)\) & \((219: 1)\) \\
marked & \((90: 20)\)
\end{tabular} \\
\hline \((83: 12)(83: 13)(83: 17)\)
\((187: 16)(246: 22)\) & \begin{tabular}{ll} 
liver & \((225: 16)\) \\
lives & \((6: 7)(6: 21)\)
\end{tabular} & \[
\begin{aligned}
& \operatorname{maintain}(16: 4) \\
& (166: 20)(275: 11)
\end{aligned}
\] & \begin{tabular}{ll} 
marked & \((90: 20)\) \\
marking & \((219: 3)\)
\end{tabular} \\
\hline \((187: 16)(246: 22)\)
\((279: 2)\) & loading (202:16) & \[
(278: 23)(279: 5)
\] & marg (1:24) \\
\hline liberty (20:25) & (203:8) & maintained (58:25) & massive (42:5) \\
\hline \((21: 19)(34: 1)(34: 18)\) & loaf (37:1)(45:13) & (152:25) (210:5) & masters (15:20) \\
\hline \((43: 24)(47: 7)(47: 8)\) & (58:9) (58:11) & (278:10) & match (190:20) \\
\hline \((47: 18)(47: 20)(71: 19)\) & local (18:11) (22:10) & maintaining (22:24) & materials (23:4) \\
\hline \((72: 1)(72: 4)(72: 11)\) & (22:19) (22:20) (161:12) & (134:5) (153:3) (167:19) & \[
\operatorname{math}_{(255: 8)}(169: 2)(171: 3)
\] \\
\hline \((73: 6)(76: 23)(77: 5)\) & locate (80:22) & maintenance (55:22) (153:3)(185:12) & \[
\left\lvert\, \begin{aligned}
& (255: 8) \\
& \text { matrix } \quad(61: 20)
\end{aligned}\right.
\] \\
\hline \((77: 9)(77: 15)(77: 18)\) & located (21:19)
\((32: 12)(77: 22)(77: 24)\) & \[
\begin{aligned}
& (153: 3)(185: 12) \\
& (187: 24)(277: 23)
\end{aligned}
\] & \[
\begin{array}{|ll}
\text { matrix } & (61: 20) \\
\text { matter } & (7: 23)(17: 6)
\end{array}
\] \\
\hline \((79: 21)(81: 12)(83: 3)\)
\((83: 24)(86: 8)(144: 24)\) & \((32: 12)(77: 22)(77: 24)\)
\((78: 5)(79: 22)(80: 20)\) & \[
\begin{aligned}
& (187: 24)(277: 23) \\
& (279: 14)
\end{aligned}
\] & \[
\begin{array}{ll}
\operatorname{matter} & (7: 23)(17: 6) \\
(18: 20) & (18: 21)(20: 12)
\end{array}
\] \\
\hline (229:9)(229:14) & \((81: 3)(81: 12)(150: 8)\) & major (122:23) & (20:14) (21:1) (21:5) \\
\hline (231:24) (233:19) & (159:22) & majority (100:8) & \((21: 17)(33: 2)(33: 3)\) \\
\hline \((233: 22)(243: 16)\) & location (43:22) & (201:19) & \((33: 18)(33: 21)(42: 18)\) \\
\hline (245:2) (277:8) & (77:9) (78:7) (78:9) & makes (10:17) (10:18) & \[
(42: 25)(43: 2)(43: 21)
\] \\
\hline license (207:17) & (208:9) (233:19) & \((23: 13)(24: 2)(149: 22)\)
\((149: 24)(189: 24)\) & \[
\begin{aligned}
& (44: 10)(44: 12)(45: 7) \\
& (45: 21)(45: 23)(46: 10)
\end{aligned}
\] \\
\hline lids (105:24)(266:9) & \[
\begin{aligned}
& \text { locked }(273: 15) \\
& \text { logo }(224: 25)
\end{aligned}
\] & \[
\begin{aligned}
& (149: 24)(189: 24) \\
& (189: 25)
\end{aligned}
\] & \[
\begin{aligned}
& (45: 21)(45: 23)(46: 10) \\
& (73: 24)(74: 13)(76: 17)
\end{aligned}
\] \\
\hline \((268: 19)\)
light (33:8)(33:10) & \begin{tabular}{ll} 
logo & \((224: 25)\) \\
long & \((14: 13)(14: 19)\)
\end{tabular} & making (12:12)(15:8) & \[
(76: 20)(76: 21)(77: 2)
\] \\
\hline \[
\begin{array}{ll}
\text { light } & (33: 8)(33: 10) \\
(37: 21) & (38: 1)(179: 19)
\end{array}
\] & \[
(37: 2)(37: 5)(43: 14)
\] & (38:17) (39:21) (40:24) & \((77: 8)(126: 16)(144: 3)\) \\
\hline \((179: 20)(179: 24)\) & \((47: 8)(64: 13)(66: 7)\) & \((50: 12)(62: 12)\) & (164:7) (164:8) \\
\hline (271:16) & \((73: 22)(74: 3)(74: 5)\) & \((126: 20)(148: 19)\) & \((168: 12)(168: 13)\) \\
\hline
\end{tabular}
\begin{tabular}{|c|c|c|c|}
\hline \multicolumn{2}{|l|}{matters} & \multicolumn{2}{|r|}{more} \\
\hline (194:6) (232:17) & (94:18) (95:19) & (205:11) (206:2) & \((77: 16)(77: 18)(77: 25)\) \\
\hline (239:25) & (126:10) (128:14) & (214:23) & \[
(78: 2)(78: 5)(78: 7)
\] \\
\hline matters (90:24) & \((128: 25)(137: 1)\)
\((143: 21)(143: 23)\) & \[
\begin{aligned}
& \text { million-dollar } \\
& \text { million-dollar-plus }
\end{aligned}
\] & \[
\begin{aligned}
& (79: 19)(79: 22)(80: 17) \\
& (80: 20)(80: 23)(81: 12)
\end{aligned}
\] \\
\hline \((117: 21)\)
\(\max (1: 17)(20: 1)\) & \[
\begin{aligned}
& (143: 21)(143: 23) \\
& (149: 19)(153: 4)
\end{aligned}
\] & \[
\begin{aligned}
& \text { million-dollar-plus } \\
& \text { million-plus (205:20) }
\end{aligned}
\] & \[
\begin{aligned}
& (80: 20)(80: 23)(81: 12) \\
& (81: 14)(83: 3)(83: 4)
\end{aligned}
\] \\
\hline \(\max _{(45: 11)}\) & (153:18) (155:19) & millions (9:7) & \((83: 21)(84: 7)(86: 8)\) \\
\hline maximum (68:17) & (155:20) (155:25) & \((10: 25)(11: 12)\) & (101:21) (142:11) \\
\hline \((81: 4)(83: 1)(83: 21)\) & \((156: 13)(157: 1)\) & mind (6:11)(7: & (142:19) (142:20) \\
\hline (83:24) (155:20) & (164:4) (168:3)(171:2) & \((34: 7)(48: 7)(53: 15)\) & (142:22) (142:24) \\
\hline (156:11) (280:14) & \((197: 22)(238: 25)\) & (71:11) (171:24) & (143:15) (144:11) \\
\hline means (10:1)(10:3) & (243:11) (249:17) & minds (196:9) & (144:13) (144:14) \\
\hline \((11: 5)(40: 17)(72: 23)\) & (276:16) (282:18) & minimal (13:1) & (144:17) (144:24) \\
\hline \((73: 1)(115: 14)(190: 3)\) & (283:11) (284:10) & minimizing (279:1) & (159:15) (159 \\
\hline \((248: 5)(253: 3)\) & mentions (112:16) & minimum (37:12) & \((159: 22)(160: 4)\) \\
\hline (255:19) (265:15) & mess (44:5) & (51:22) & \((160: 25)(161: 1)\) \\
\hline (271:19) 75.9\()(78: 8)\) & messy (30:15) & minor \((75: 3)(75: 22)\)
\((77: 4)(84: 4)\) & \[
\begin{aligned}
& (177: 3)(179: 19) \\
& (229: 9)(229: 10)
\end{aligned}
\] \\
\hline \[
\begin{aligned}
& \text { measure }(75: 9)(78: 8) \\
& (123: 6)(142: 25)
\end{aligned}
\] & met (12:14)(12:23)
\((60: 17)(60: 21)(134: 1\) & (77:4) (84:4)
minute (94:13) & \[
(229: 14)(231: 24)
\] \\
\hline (143:7) (154:15) & (183:9) (197:9) & (228:22) & \((233: 20)(233: 22)\) \\
\hline \((177: 5)(177: 6)(177: 7)\) & meteorology (29:1) & minutes (188:18) & \[
(243: 16)(243: 24)
\] \\
\hline (179:16) (179:23) & (34:19)(150:3) (277:5) & (188:21) & \[
\begin{aligned}
& (245: 2)(277: 8) \\
& \text { monitored } \quad(19: 19)
\end{aligned}
\] \\
\hline \((246: 22)(271: 18)\)
\((271: 22)(274: 19)\) & meter (76:25)
m-e-t-h-a-c-r-y & \begin{tabular}{l}
miscellaneous \\
mixture (223:16)
\end{tabular} & monitored in (20:20) \\
\hline \[
\begin{aligned}
& (271: 22)(274: 19) \\
& (277: 13)(277: 18)
\end{aligned}
\] & m-e-t-h-a-c-r-y
methacrylates & \[
\text { mmhmen }(105: 17)
\] & monitoring (17:19) \\
\hline (281:24) & methochloride & (256:13) (256:15) & (20:18) (20:20) (20:22) \\
\hline measured (177:2) & method (26:3) ( \(34: 11\) ) & (282:20) & (20:23) (22:24) (43:22) \\
\hline \((177: 12)(179: 18)\) & \((63: 9)(63: 11)(63: 23)\) & mobile (176:17) & (64:11) (71:17) (71:18) \\
\hline (251:7) (265:1) & \((63: 25)(64: 1)(64: 3)\) & model (28:17) (28:22) & (72:7) (81:13) (175:6) \\
\hline (274:10) (281:14) & \((64: 15)(135: 15)\) & (29:11) (29:12) ( \(30: 20)\) & (211:8) (239:18) \\
\hline (281:15) & \((135: 17)(135: 20)\) & (30:25) (31:17) & (278:25) \\
\hline measurement (177:3) & \((136: 5)(136: 6)(136: 8)\) & (147:18) (149:25) & monitors (19:21) \\
\hline measurements (10:2) & \((136: 11)(136: 15)\) & (150:12) (175:24) & (21:3) (21:13) (21:14) \\
\hline measures (7:19) & \((136: 20)(137: 7)\) & \((262: 19)(280: 5)\)
\((280: 6)(280: 10)\) & \[
(43: 18)(43: 19)(43: 20)
\] \\
\hline (8:13) (24:14) (47:9) & (137:16) (137:21) & \((280: 6)(280: 10)\)
\((282: 24)(283: 4)\) & \[
(47: 19)(52: 14)(72: 3)
\] \\
\hline \((79: 23)(159: 2)\)
\((159: 23)(175: 6)\) & \((137: 23)(138: 3)\)
\((138: 11)(138: 21)\) & (283:8) (283:10) & \((72: 10)(72: 15)(73: 14)\) \\
\hline (179:20) & (250:8) (250:11) & modeled (150:9) & \[
(77: 2)(79: 15)(81: 18)
\] \\
\hline measuring (33:3) & methodology (132:16) & \[
\left\lvert\, \begin{aligned}
& \text { (199:18) } \\
& \text { modeling }
\end{aligned}\right.
\] & (86:22) (95:6) (95:7)
\[
(124: 22)(142: 8)
\] \\
\hline \((57: 23)(77: 2)(81: 15)\)
\((83: 22)(143: 10)\) & (133:12)
methods (10:8) & \[
(80: 22)(86: 2)(86: 9)
\] & \[
(159: 14)(273: 23)
\] \\
\hline \((83: 22)(143: 10)\)
\((273: 20)(275: 6)\) & methods
\((10: 14)(26: 5)(135: 1)\) & \((86: 11)(88: 18)(88: 20)\) & month (12:16)(12:19) \\
\hline mechanical (15:18) & \((135: 4)(135: 6)\) & (147:5) (147:10) & \((49: 13) \cdot(63: 7)(130: 5)\) \\
\hline (105:15) (151:2) & \((135: 12)(135: 20)\) & (147:16) (147:19) & \((133: 22)(134: 7)\) \\
\hline (151:12) (151:13) & \((138: 13)(138: 17)\) & (148:2) (148:10) & (170:20) (171:4) \\
\hline media (110:1)(110:7) & \((140: 20)(141: 4)(141: 7)\) & \((148: 25)(149: 3)\) & (260:13) (260:22) \\
\hline (110:11) (111:7) & metric (52:3)(57:4) & (149:9) (149:23) & (261:1) (261:5) \\
\hline \((112: 3)(117: 19)\) & (61:12) (61:15) (61:17) & (150:14) (150:17) & month/year (167:2) \\
\hline (245:14) & \((123: 5)(157: 18)(158: 8)\) & (150:19) (159:24) & months (12:17) \\
\hline meet (8:17)(11:4) & metrological (159:16) & \((175: 19)(175: 24)\) & (53:11) (53:16) (66:8) \\
\hline \((17: 2)(19: 18)(21: 14)\) & michael (2:6)(2:13) & \[
(176: 1)(248: 23)
\] & \begin{tabular}{l}
(66:10) (66:12) (66:16) \\
(110:22) (114:17)
\end{tabular} \\
\hline (24:14) (24:15) (26:20) & (5:10)(5:13) & \[
\begin{aligned}
& \text { moment } \\
& (273: 3)
\end{aligned} \quad(113: 21)
\] & \[
(114: 23)(115: 19)
\] \\
\hline \((27: 1)(51: 20)(54: 24)\) & microgram (161:6) & \[
\begin{aligned}
& (273: 3) \\
& \text { monday }(5: 2
\end{aligned}
\] & \[
(133: 22)(134: 8)
\] \\
\hline \[
\begin{aligned}
& (72: 23)(93: 4)(128: 15) \\
& (129: 2)(129: 10)
\end{aligned}
\] & (161:8)
micrograms ( & \[
\text { monessen }(163: 19)
\] & \((136: 1)(163: 1)\) \\
\hline \((130: 3)(134: 4)(134: 6)\) & (160:1) (160:15) & (204:14)(204:15) & \((182: 23)(222: 5)\) \\
\hline (182:18) (211:6) & (161:3) (161:11) & (204:17) (205:8) (205:9) & mon-valley (21:1) \\
\hline (239:16) (242:15) & microns (7:23) & monetary (92:24) & more (12:16)(12:21) \\
\hline \((256: 6)(259: 7)(259: 9)\) & (20:13) (76:21) & money (218:19) & (24:11) (24:16) (26:14) (26:21) (27:7) (28:1) \\
\hline (261:15) (275:7) & micronucleate & \[
\begin{aligned}
& \text { monitor }(16: 19) \\
& (17: 19)(19: 15)(19: 22)
\end{aligned}
\] & \[
\begin{aligned}
& (26: 21)(27: 7)(28: 1) \\
& (30: 22)(36: 12)(38: 21)
\end{aligned}
\] \\
\hline meeting (17:4)(21:4) & middle (204:12)
\((204: 14)\) & \[
\begin{aligned}
& (17: 19)(19: 15)(19: 22) \\
& (19: 23)(20: 24)(20: 25)
\end{aligned}
\] & \[
(41: 14)(47: 18)(63: 7)
\] \\
\hline \((29: 9)(88: 11)(88: 14)\)
\((90: 2)(130: 4)(130: 5)\) & mid-morning (78:12) & (21:2) (32:12) (32:21) & \((67: 23)(67: 25)(68: 1)\) \\
\hline (190:5) (190:14) & mid-sentence (224:9) & \((32: 22)(32: 24)(33: 7)\) & \((68: 9)(68: 12)(86: 12)\) \\
\hline (202:12) (202:19) & might (12:20)(88:7) & \((33: 9)(34: 1)(34: 3)\) & \((88: 19)(95: 22)(96: 1)\) \\
\hline mention (29:10) & (237:16) (274:5) & \((34: 18)(34: 25)(35: 3)\) & \((96: 9)(96: 10)(96: 12)\) \\
\hline mentioned (18:3) & mike (65:12) \((65: 23)\) & \((35: 5)(35: 10)(36: 2)\) & (104:25) (117:23) \\
\hline (20:8) (21:18) (27:14) & miles (85:4) & \((36: 14)(43: 22)(43: 23)\) & (129:23) (144:13) \\
\hline (28:8) (32:18) (34:1) & million (7:13) & \((47: 7)(47: 9)(47: 20)\) & (144:16) (148:3) \\
\hline \((41: 1)(45: 6)(48: 14)\) & \((11: 12)(61: 7)(111: 16)\) & \((71: 19)(72: 1)(72: 11)\) & (149:3) (152:24) \\
\hline \((53: 11)(80: 16)(88: 25)\) & \((114: 6)(156: 6)(156: 8)\) & \((72: 14)(73: 6)(73: 8)\) & (164:2) (167:25) \\
\hline \((92: 4)(93: 12)(93: 19)\) & (192:2) (192:3) & \((75: 23)(77: 5)(77: 9)\) & (168:1) (175:25) \\
\hline
\end{tabular}
\begin{tabular}{|c|c|c|c|}
\hline \multicolumn{2}{|l|}{morning} & \multicolumn{2}{|r|}{occurred} \\
\hline (178:6) (179:24) & (230:19) (230:20) & (155:15) (180:4) & (108:16) (109:17) \\
\hline \((179: 25)(181: 4)\) & (230:21) (249:13) & \((183: 25)(184: 10)\) & (115:4) (11 \\
\hline (182:6) (183:13) & named (286:7) & (227:19) (262:14) & (119:22) (131:13) \\
\hline \((187: 5)(194: 2)\) & namely (187:11) & newer (254:18) & (131:18) (131:24) \\
\hline \((194: 15)(195: 13)\) & naphthalene (226:17) & (254:20) (254:24) & \[
(132: 13)(141: 14)
\] \\
\hline (208:3) (208:16) & nastiest (44:24) & (255:4) & (154:11) \\
\hline (212:18) (224:1) & national (19:2) & nine (4:14)(12:21) & (1 \\
\hline (234:12) (234:14) & (19:7) (19:11) (21:15) & \((21: 5)(63: 23)(63: 25)\)
\((64: 1)(64: 4)(135: 15)\) & \[
(170: 7)(170: 9)(171: 3)
\] \\
\hline (234:16) (235:15) & \((24: 21)(24: 23)(29: 17)\)
\((30: 16)(30: 23)(153: 8)\) & \((64: 1)(64: 4)(135: 15)\)
\((135: 18)(135: 20)\) & \[
(174: 18)(177: 15)
\] \\
\hline \((254: 21)(255: 7)\)
\((255: 19)(255: 24)\) & \((30: 16)(30: 23)(153: 8)\)
\((283: 14)\) & \((135: 18)\)
\((136: 20)(137: 7)\) & \((177: 16)(178: 13)\) \\
\hline (257:17) (263:19) & natural (38:7) & (137:16) (137:21) & (187:16) (212:2) \\
\hline (270:24) (271:14) & naturally (75:12) & \((137: 23)(138: 3)\) & (214:4) (214:6) \\
\hline \((271: 15)(271: 16)\) & (76:8) & \((167: 7)(167: 11)\) & (214:11) (230:9) \\
\hline (271:17) (271:25) & nature (69:25) & (171:11) (171:12) & (266:20) \\
\hline (275:16) & nby (173:20) & (191:24) (206:12) & (269:14) (269:16) \\
\hline morning (227:14) & near (84:6) (156:11) & \[
(222: 5)(228: 10)
\] & \[
\begin{aligned}
& (273: 20)(278: 5) \\
& (278: 18)
\end{aligned}
\] \\
\hline most (6:7)(6:12) & (193:16)
necessarily & \[
\begin{aligned}
& (229: 16)(229: 17) \\
& (229: 21)
\end{aligned}
\] & numbers (47:2) (72:1) \\
\hline \[
\begin{aligned}
& (6: 20)(7: 5)(9: 15) \\
& (23: 1)(23: 7)(27: 2)
\end{aligned}
\] & \[
\begin{aligned}
& \text { necessarily (17 } \\
& \text { (254:9) }
\end{aligned}
\] & nitrogen (35:17) & \[
(82: 6)(82: 7)(82: 25)
\] \\
\hline \((35: 20)(71: 10)(71: 15)\) & necessary (24:14) & (36:4) & \[
(87: 13)(97: 13)(102: 5)
\] \\
\hline (91:17) (129:21) & (26:8) (60:20) (96:13) & non- (215:8) & (102:12) (104:22)
\[
(115: 4)(142: 2)
\] \\
\hline (142:11) (142:19) & \((127: 12)\)
(193:23)
needed
\((65: 15)\) & \begin{tabular}{l}
non-attainment \\
non-attorneys
\end{tabular} & \[
(166: 16)(178: 18)
\] \\
\hline \((144: 4)(161: 23)\)
\((162: 8)(182: 10)\) & needed (65:15)
\((65: 17)(119: 4)\) & noncompliance & \((178: 20)(178: 25)\) \\
\hline (193:8) (197:17) & needs (19:5)(66:4) & non-compliant & \[
(179: 8)(180: 3)(203: 5)
\] \\
\hline \((202: 10)(235: 14)\)
\((237: 16)(264: 20)\) & (227:18)(255:20)
negotiated (9:5) & \[
\begin{aligned}
& \text { none (198:15) } \\
& (241: 18)(252: 8)
\end{aligned}
\] & \[
\begin{aligned}
& (264: 1)(280: 23) \\
& (280: 24)
\end{aligned}
\] \\
\hline (237:16) (264:20) & negotiated (9:5) & \[
\begin{aligned}
& \text { (241:18)(252:8) } \\
& \text { non-existent (281:3) }
\end{aligned}
\] & \\
\hline (265:12) (266:13) & (264:16) & non-related (252:23) & 0 \\
\hline \(\begin{array}{ll}\text { (266:25) } \\ \text { mostly } & (197: 18)\end{array}\) & \[
(70: 7)(263: 2)
\] & non-stack (31:22) & oath (129:4)(129:14) \\
\hline (198:7) & neither (13:9) & nor (286:10) & (129:15) (244:9) \\
\hline move (68:23)(71:3) & (286:10) & normally (197:12) & (244:10) (260:5) \\
\hline \((84: 13)(171: 24)\) & nervous (225:14) & (281:24) & object (111:21) \\
\hline \((172: 6)(210: 14)\) & (225:19) & north (72:4) (85:7) & \[
\begin{aligned}
& (217: 10)(233: 5) \\
& \text { objecting } \quad(234: 3)
\end{aligned}
\] \\
\hline (213:8) (215:3) (228:9) & neshap (12:2)(19:10) & \[
\begin{aligned}
& \text { notary }(286: 6) \\
& (286: 21)
\end{aligned}
\] & \begin{tabular}{l}
objecting (234:3) \\
objection (90:10)
\end{tabular} \\
\hline (229:15) (248:13) & \((19: 11)(19: 25)(29\)
\((27: 9)(27: 10)(63\) & notation (203:20) & \[
(90: 13)(90: 14)
\] \\
\hline moved (121:4)
moves (269:14) & \((27: 9)(27: 10)(6)\)
\((63: 17)(140: 12)\) & note (7:7) (49:16) & (113:23) (172:6) \\
\hline moving (46:19) & (153:4) (153:7) & (217:22) (224:21) & (172:23) (210:10) \\
\hline (84:19) (225:4) (226:23) & (153:17) (153:19) & noted (7:15) (161:14) & (213:23) (213:24) \\
\hline much \((30: 24)(33: 10)\) & (153:24) (154:8) & nothing (41:17) & \((217: 25)(227: 25)\) \\
\hline (36:8) (36:15) (38:3) & (154:13) (182:3) & (45:14) (49:3) (59:22) & (228:2) (228:5) \\
\hline \((121: 23)(122: 8)\) & \((201: 10)(235: 5)\) & \((74: 25)(219: 6)\) & \[
(229: 18)(229: 19)
\] \\
\hline \((145: 3)(160: 3)(160: 7)\) & (249:8) (249:12) & (244:13) (285:6) (286:8) & \[
(234: 7)
\] \\
\hline \((161: 12)(1.77: 22)\) & (249:25) (250:4) & notice (69:24)(70:8) & objections (234:9) \\
\hline \((177: 23)(177: 25)\) & (260:14) (283:2) & \[
(70: 11)(70: 24)(71: 1)
\] & \begin{tabular}{l}
obligation (8:4) \\
(17:16)(18:14)(18:21)
\end{tabular} \\
\hline (178:5) (178:7) & (283:7) (284:13) & \((72: 10)(99: 8)(99: 13)\) (104:2) (146:22) & obscures (116:10) \\
\hline \((178: 10)(179: 20)\)
\((179: 21)(180: 1)\) & (284:14)
neshaps (154:6) & \[
(211: 17)(212: 2)
\] & \[
(116: 20)
\] \\
\hline (183:13) (199:21) & (154:15) (154:18) & (212:11) (213:9) (286:7) & observations (9:17) \\
\hline (202:16) (209:25) & \((249: 22)(283: 4)(283: 5)\) & noticed (252:12) & (105:21) (230:25) \\
\hline (214:21) (269:9) & network (17:19) & notification (199:5) & observed (46:6) \\
\hline (275:21) & \((19: 15)(22: 24)(23: 1)\) & noting (8:16) & \((55: 20)(153: 2)\) \\
\hline multiple (246:25) & (71:17) & notion (203:15) & observers (137:7) \\
\hline (248:16) (68:7) & networks (20:24) & notwithstand (273:24) & obviously (42:15)
\[
(49: 3)(49: 7)(57: 23)
\] \\
\hline multiplying (68:7) & never (12:23)(23:23)
\((101: 13)(118: 22)\) & \[
\begin{aligned}
& \text { nov }(4: 13)(4: 16) \\
& (210: 16)(211: 12)
\end{aligned}
\] & \((69: 3)(49: 7)(68: 11)(74: 16)\) \\
\hline municipal (75:2) & \[
\begin{aligned}
& (101: 13)(118: 22) \\
& (118: 24)(119: 4)
\end{aligned}
\] & november (210:16) & (82:1) \((98: 7)(99: 11)\) \\
\hline must (51:20)(67:16) & \((121: 15)(122: 8)\) & novice (151:11) & \((117: 17)(125: 2)\) \\
\hline mutagen (224:18) & \((147: 10)(149: 8)\) & nowhere (105:10) & \((125: 6)(132: 6)(134: 4)\) \\
\hline mutagenicity (223:5) & \((149: 12)(150: 18)\) & (106:9) & (144:19) (267:8) \\
\hline (223:15) (223:17) & (196:3) (242:6) & nrv (85:22) & occasion (96:15) \\
\hline N & \[
\begin{array}{|l}
\text { new } \quad(11: 17)(12: 13) \\
(27: 25)(48: 9)(59: 22)
\end{array}
\] & (145:18) (145:19) & occasional (174:17) \\
\hline naaqs (18:25)(21:15) & (65:12) (65:24) (67:23) & (246:23) & occasionally (1 (230:16) \\
\hline \((24: 15)(25: 13)(25: 18)\) & \((95: 20)(98: 7)(98: 13)\) & number (28:21) & \[
(230: 16)
\] \\
\hline \((25: 20)(25: 21)(35: 25)\) & \((98: 24)(99: 24)(100: 8)\) & \[
(36: 16)(42: 3)(54: 3)
\] & occasions (246:1) \\
\hline (161:8) & (100:21) (103:14) & (62:5) (62:7) (63:3) & occupation (14:9) \\
\hline \[
\begin{aligned}
& \text { name }(14: 6)(14: 7) \\
& (173: 21)(224: 25)
\end{aligned}
\] & \((104: 24)(126: 1)\)
\((126: 14)(155: 13)\) & \[
\begin{aligned}
& (64: 22)(68: 24)(73: 19) \\
& (84: 8)(84: 10)(91: 3)
\end{aligned}
\] & \[
\begin{array}{ll}
\text { occur } & (162: 25) \\
\text { occurred } & (7: 18) \\
\hline
\end{array}
\] \\
\hline
\end{tabular}

\begin{tabular}{|c|c|c|c|}
\hline \multicolumn{2}{|l|}{ourselves} & \multicolumn{2}{|r|}{people} \\
\hline (121:1)(143:3)(148:2) & (234:7) & (123:22) (124:23) & (125:5) \\
\hline \((152: 21)(153: 2)\) & oversimplification & (125:5) (126:21) & penalizes (61:3) \\
\hline \((159: 24)(164: 1)\) & oversimplify (36:23) & \((133: 15)(137: 23)\) & penalties (8:7) \\
\hline \((165: 10)(165: 19)\) & overwhelming (194:2) & (158:5) (183:11) & (8:12) (10:16) (65:4) \\
\hline (176:3) (180:4) & overwhelmingly & (196:5) (202:8) & \[
(66: 4)(96: 5)(96: 6)
\]
\[
(99: 4)(105: 2)(125: 23)
\] \\
\hline \((181: 10)(182: 10)\) & own (61:1)(150:18) & \((202: 21)(206: 21)\)
\((207: 20)(208: 19)\) & \[
(99: 4)(105: 2)(125: 23)
\]
\[
(152: 18)(152: 20)
\] \\
\hline (182:11) (183:11) & \((175: 13)(187: 5)\) & \[
\begin{aligned}
& (207: 20)(208: 19) \\
& (208: 21)(209: 14)
\end{aligned}
\] & \[
\begin{aligned}
& (152: 18)(152: 20) \\
& (181: 10)(182: 15)
\end{aligned}
\] \\
\hline \((187: 14)\)
\((193: 12)\)
\((193: 21)\) & \[
\begin{aligned}
& (276: 13) \\
& \text { oxide } \quad(38: 19)
\end{aligned}
\] & \[
\begin{aligned}
& (208: 21)(209: 14) \\
& (218: 23)(222: 15)
\end{aligned}
\] & \[
\begin{aligned}
& (181: 10)(182: 15) \\
& (182: 16)(182: 23)
\end{aligned}
\] \\
\hline \((193: 12)(193: 21)\)
\((196: 9)(198: 15)\) & oxides (35:17)(36:4) & \[
(226: 4)(226: 7)(233: 1)
\] & \((183: 15)(185: 23)\) \\
\hline (201:12) (205:17) & (42:18) (43:16) & (248:12) (248:22) & (186:1) (191:20) \\
\hline \((206: 12)(206: 23)\) & oxygen (37:14) & (249:25) (251:15) & (198) \\
\hline (209:14) (216:21) & \((37: 20)(42: 7)(43: 5)\) & (263:4) (265:21) & (199:2) (210:22) \\
\hline (232:9) (234:17) & (223:11) (225:10) & \[
(268: 4)(276: 7)
\] & \[
\begin{aligned}
& (212: 9)(213: 14) \\
& \text { penalty } \quad(7: 13)(7: 15)
\end{aligned}
\] \\
\hline \((242: 1)(244: 2)\)
\((250: 21)(252: 11)\) & ozone (17:2)(17:3)
\((17: 4)(26: 10)(35: 15)\) & \[
\begin{array}{|lc}
\text { partially } & (218: 12) \\
\text { particular } & (7: 20)
\end{array}
\] & \[
\begin{aligned}
& \text { penalty }(7: 13)(7: 15) \\
& (8: 11)(10: 22)(48: 3)
\end{aligned}
\] \\
\hline \((250: 21)(252: 11)\)
\((252: 23)(271: 13)\) & \((17: 4)(26: 10)(35: 15)\)
\((35: 19)(36: 1)(36: 3)\) & (21:11) (36:18) (158:8) & \[
(48: 9)(48: 14)(48: 19)
\] \\
\hline (271:24) (273:1) & \((44: 6)(72: 18)(175: 23)\) & (162:24) (178:23) & \((48: 22)(50: 24)(61: 6)\) \\
\hline (275:4) (284:20) & (176:3) & \((179: 4)(180: 25)\) & \[
(61: 7)(61: 8)(61: 14)
\] \\
\hline \[
\begin{aligned}
& (285: 10) \\
& \text { ourselves } \quad(27: 16)
\end{aligned}
\] & P & particulate (7:23) & \[
(65: 2)(65: 24)(67: 24)
\] \\
\hline out- (194:10) & page (3:2)(62:25) & \((17: 6)(18: 20)(18: 21)\) & \[
(68: 10)(68: 13)(68: 17)
\] \\
\hline outlined (55:16) & (63:2) (68:25) (69:2) & \[
\begin{aligned}
& (20: 12)(20: 14)(20: 25) \\
& (21: 5)(21: 17)(33: 1)
\end{aligned}
\] & \[
\begin{aligned}
& (86: 7)(92: 24)(95: 20) \\
& (96: 4)(96: 19)(96: 20)
\end{aligned}
\] \\
\hline outlining (69:25) & \((71: 24)(76: 21)(79: 16)\)
\((90: 23)(91: 5)(97: 11)\) & \[
\begin{aligned}
& (21: 5)(21: 17)(33: 1) \\
& (33: 3)(33: 18)(33: 20)
\end{aligned}
\] & \[
(97: 2)(97: 20)(97: 22)
\] \\
\hline \begin{tabular}{l}
outputs (86:10) \\
outright (51:15)
\end{tabular} & \[
(90: 23)(91: 5)(97:
\]
\[
(97: 13)(97: 16)
\] & \[
(42: 18)(42: 25)(43: 1)
\] & \[
(98: 7)(98: 11)(98: 13)
\] \\
\hline outside (176:8) & \((121: 24)(124: 9)\) & \((43: 21)(44: 9)(44: 11)\) & \((98: 20)(98: 24)(99: 2)\) \\
\hline (268:6) & (124:17) (124:18) & \((44: 12)(45: 7)(45: 21)\) & \((99: 11)(99: 25)(100: 3)\) \\
\hline oven (24:9) (27:3) & (132:18) (141:13) & \((45: 23)(46: 9)(73: 24)\) & (100:8) (100:21) \\
\hline \((27: 4)(30: 3)(30: 5)\) & (141:14) (141:21) & \((74: 13)(76: 16)(76: 20)\) & (103:14) (103:16) \\
\hline \((37: 1)(37: 3)(37: 4)\) & \((141: 24)(142: 2)\) & (77:2) (77:8) (126:15) & (103:17) (103:22) \\
\hline \((37: 8)(38: 6)(38: 11)\) & (142:3) (143:17) & \((144: 3)(168: 12)\) & (104:25) (110:5) \\
\hline \((38: 12)(38: 13)(38: 16)\) & (144:7) (210:25) & \((168: 13)(179: 7)\) & \[
(131: 1)(155: 3)(155: 4
\] \\
\hline \((39: 3)(40: 5)(40: 6)\) & \((211: 25)(217: 12)\) & \((182: 12)(192: 8)\) & \[
(155: 21)(156: 2)
\] \\
\hline \((40: 8)(40: 13)(41: 4)\) & \((217: 15)(219: 23)\) & (193:9) (194:6) &  \\
\hline \((41: 19)(42: 3)(42: 20)\) & \((220: 16)\)
\((223: 12)(225: 22)\) & (232:17) (243:23)
particulates & \[
\begin{aligned}
& (162: 24)(180: 5) \\
& (180: 20)(181: 2)
\end{aligned}
\] \\
\hline (43:4) (43:9) ( \(44: 21)\) & \((223: 12)(225: 21)\)
\((229: 4)(229: 7)\) & \begin{tabular}{l}
particulates \\
parties (6:5)(69:21)
\end{tabular} & \[
(183: 2)(183: 5)(183: 7)
\] \\
\hline \[
\begin{aligned}
& (46: 9)(57: 12)(57: 20) \\
& (57: 24)(57: 25)(58: 16)
\end{aligned}
\] & \((229: 4)(229: 7)\)
\((236: 17)\) & (70:3) (70:10) (264:19) & \[
(183: 9)(183: 12)
\] \\
\hline \((58: 24)(59: 1)(59: 8)\) & (239:12) (240:22) & (286:11) (286:12) & \[
\begin{aligned}
& (183: 17)(183: 18)
\end{aligned}
\] \\
\hline \((59: 13)(59: 22)(60: 4)\) & (244:17) (244:20) & \[
\begin{aligned}
& \text { parts }(81: 12)(83: 21) \\
& (185: 11)(232: 17)
\end{aligned}
\] & \[
\begin{aligned}
& (183: 24)(183: 25) \\
& (184: 4)(184: 9)
\end{aligned}
\] \\
\hline \((60: 6)(156: 19)\)
\((166: 13)(168: 14)\) & \((260: 8)(261: 8)\)
\((261: 11)(264: 3)\) & \[
\left\lvert\, \begin{array}{ll}
(185: 11) & (232: 17) \\
\text { party } & (5: 6)(8: 4)
\end{array}\right.
\] & \[
\begin{array}{|l}
(184: 4)(184: 9) \\
(184: 14)(186: 1)
\end{array}
\] \\
\hline \((166: 13)(168: 14)\)
\((189: 4)(197: 1)\) & \((261: 11)(264: 3)\)
\((278: 3)(278: 17)\) & \[
(67: 2)(69: 24)(69: 25)
\] & (186:4) (186:8) \\
\hline (197:13) (197:14) & (278:19) & \((70: 11)(130: 18)\) & (186:20) (191:18) \\
\hline (201:18) (202:12) & pages (91:6) \((263: 24)\) & (130:19) (131:25) & (191:23) (192:3) \\
\hline (202:17) (221:11) & paid (183:4) (216:10) & (132:2) & (198:11) (198:22) \\
\hline (222:2) (222:20) & (216:15) & party's (69:20) & (199:9) (205:11) \\
\hline (223:2) (223:16) & paper (174:21) & (70:11)
pass (23:22) (87: & \[
(205: 24)(206: 3)
\] \\
\hline \((224: 22)(225: 6)\)
\((226: 4)(227: 14)\) & paragraph (69:17)
\[
(124: 18)(132: 17)
\] & \[
(147: 22)(148: 22)
\] & (211:21) (212:7) \\
\hline (249:16) (270:19) & (199:9) (210:25) & (180:12) & (213:10) (214:19) \\
\hline \((270: 21)(270: 22)\) & (212:10) (212:16) & passed (197:21) & \[
\begin{aligned}
& (214: 21)(215: 2) \\
& (216: 3)(216: 10)
\end{aligned}
\] \\
\hline \((270: 25)(271: 3)\) & \[
(215: 20)(215: 24)
\] & \[
\begin{aligned}
& (227: 22) \\
& \text { past }(28: 16)(28: 23)
\end{aligned}
\] & \[
\begin{aligned}
& (216: 3)(216: 10) \\
& (216: 11)(216: 12)
\end{aligned}
\] \\
\hline \((278: 9)(282: 5)(282: 6)\)
\((283: 11)\) & \[
\begin{aligned}
& (218: 7)(221: 7) \\
& (221: 20)(221: 23)
\end{aligned}
\] & past \((28: 16)(28: 23)\)
\((29: 1)(30: 12)(47: 3)\) & \[
\begin{aligned}
& (216: 11)(216: 12) \\
& (216: 14)(218: 15)
\end{aligned}
\] \\
\hline ovens (11:21) \((25: 16)\) & \((221: 24)(229: 5)\) & \((49: 5)(49: 15)(53: 20)\) & \((256: 6)(256: 10)\) \\
\hline \((25: 17)(32: 15)(37: 2)\) & (229:7) (239:13) & \((55: 19)(59: 18)(80: 10)\) & (256:11) (256:12) \\
\hline \((37: 4)(37: 7)(37: 9)\) & (264:13) (264:19) & (96:2) (163:8) (164:23) & \[
(256: 16)(256: 19)
\] \\
\hline \((37: 10)(38: 22)(57: 17)\) & park (227:9)(227:11) & (166:23) (182:13) &  \\
\hline \((58: 10)(60: 19)\) & parker (2:13)(5:10) & (182:21) (191:18)
\[
(245: 11)(275: 23)
\] & pending (172:25) \\
\hline \((153: 16)(189: 3)\) & \((65: 13)(69: 11)\)
part \((8: 6)(19: 12)\) & \[
\begin{aligned}
& (245: 11)(275: 23) \\
& (276: 18)(276: 20)
\end{aligned}
\] & pennsylvania (1:14) \\
\hline \((201: 9)(227: 10)\)
\((248: 11)(266: 6)\) & part \((8: 6)(19: 12)\)
\((22: 12)(23: 5)(31: 13)\) & pausing (258:17) & (1:24) (18:13) (22:8) \\
\hline overall (13:1) & \((56: 16)(57: 5)(57: 6)\) & pay (61:19)(183:7) & \[
\begin{aligned}
& (22: 15)(23: 11)(31: 4) \\
& (192: 1)(225: 24)(286: 2)
\end{aligned}
\] \\
\hline (159:13) (170:13) & \((60: 7)(60: 12)(61: 12)\) & \[
(183: 8)(183: 19)
\] & \[
(192: 1)(225: 24)(286: 2)
\]
\[
\text { people }(10: 25)(18: 9)
\] \\
\hline (255:13) (255:15) & \((61: 17)(61: 20)(88: 25)\) & payment (199:4) &  \\
\hline (255:17) (255:20) & \((94: 1)(94: 17)(118: 4)\) & pays (139:15) & \[
(86: 25)(148: 13)
\] \\
\hline overexposure & (118:8) (118:9) (119:8) & penalize (50:15) & \[
(149: 6)(164: 1)(175: 5)
\] \\
\hline overhearing (6:2) & \[
\begin{aligned}
& (119: 9)(122: 21) \\
& (123: 2)(123: 3)(123: 9)
\end{aligned}
\] & \[
\begin{aligned}
& (198: 23) \\
& \text { penalized } \quad(61: 18)
\end{aligned}
\] & \[
(181: 7)(202: 23)
\] \\
\hline
\end{tabular}

purpose
\begin{tabular}{|c|c|c|c|}
\hline \((12: 4)(15: 10)(16: 20)\) & (278:12) (279:1) (279:7) & (122:8) (134:5) (175:8) & project (29:1) \\
\hline \((16: 22)(16: 23)(16: 25)\) & pre (6:3) & (202:12) (217:10) & (65:24) (66:18) (202:9) \\
\hline \((19: 4)(19: 6)(19: 12)\) & preceding (54:12) & (249:3) (270:5) & (231:14) (231:16) \\
\hline \((19: 14)(19: 16)(19: 18)\) & precise (204:16) & problems (26:25) & \[
\begin{array}{ll}
\text { projects } & (9: 6)(202: 8) \\
\text { prolonged } & (44: 18)
\end{array}
\] \\
\hline \((19: 21)(19: 25)(20: 10)\) & preclude (53:15) & \((55: 16)(58: 6)(58: 20)\)
\((116: 20)(121: 18)\) & prolonged (44:18)
\[
(223: 10)(225: 17)
\] \\
\hline \((20: 19)(21: 12)(21: 16)\)
\((25: 3)(27: 11)(27: 13)\) & predecessor (85:18)
prefaced (193:5) & \[
\begin{aligned}
& (116: 20)(121: 18) \\
& (196: 16)(196: 18)
\end{aligned}
\] & \[
\begin{aligned}
& (223: 10)(225: 17) \\
& (225: 19)
\end{aligned}
\] \\
\hline \((32: 10)(34: 13)(40: 11)\) & prefer (136:16) & (196:21) (248:6) & promotional (228:16) \\
\hline \((42: 13)(42: 16)(42: 17)\) & prehearing (90:12) & procedure (65:18) & promulgated (153:14) \\
\hline \((42: 23)(43: 20)(72: 17)\) & preparations (163:4) & (146:15) & (165:15) \\
\hline \((72: 18)(75: 6)(126: 13)\) & prepare (241:7) & procedures (10:7) & promulgation (187:15) \\
\hline \((126: 18)(143: 21)\) & preparing (241:1) & (10:11) (33:5) (49:19) & proof (8:5) \\
\hline (153:9) (153:13) & pre-precipitation & (49:23) (65:14) (95:23) & proper (10:14)(141:3) \\
\hline (154:16) (154:19) & present (2:13)(43:4) & \((137: 24)(146: 10)\) & properly (41:20) \\
\hline (156:19) (240:4) & presentation (79:16) & (146:13) (150:13) & (152:25) (189:22) \\
\hline (245:14) (249:9) & (112:13) (231:15) & (164:6) (164:12) & (278:10) \\
\hline (249:12) (249:15) & (231:17) & (165:4) (165:5) (165:7) & property (22:3) \\
\hline (250:22) (251:5) & presentations (96:15) & (165:10) (165:13) & proposal (231: \\
\hline (257:11) (262:17) & presented (112:8) & \((165: 14)(165: 19)\) & (272:20) \\
\hline (270:13) (283:15) & (115:4) (180:14) & (165:21) & proposed (27:23) \\
\hline polluting (162:8) & \((180: 16)(180: 18)\) & proceed (5:22) & \[
\begin{aligned}
& (127: 16)(195: 7) \\
& (195: 21)(272: 20)
\end{aligned}
\] \\
\hline pollution (27:1) & (263:11) & (13:13) (13:15)(91:12) & \[
\begin{aligned}
& (195: 21)(272: 20) \\
& (273: 24)
\end{aligned}
\] \\
\hline (34:11) (35:1) (86:22) & presently (157:3) & \begin{tabular}{l}
proceeded (16:14) \\
(207:22)
\end{tabular} & \[
\text { protect }(23: 8)(96: 13)
\] \\
\hline \[
\begin{aligned}
& (142: 25)(143: 10) \\
& (174: 18)(208: 12)
\end{aligned}
\] & (157:7) (196:19) & proceedings (5:1) & protection (14:24) \\
\hline (227:8) (227:10) & (196:24) (197:2) & process (12:13) & \((23: 12)(51: 13)(68: 3)\) \\
\hline (227:17) (227:19) & presume (174:2) & (28:19) (31:13) (31:14) & (145:15) \\
\hline (255:25) (278:12) & (272:7) & \((31: 15)(38: 18)(38: 23)\) & protective (19:8) \\
\hline \((278: 24)(279: 1)(279: 6)\) & presuming (72:3) & \((39: 4)(40: 23)(40: 24)\) & (27:11) (96:11) \\
\hline poor (178:1)(281:2) & pretty (32:11)(39:4) & (66:7) (76:3) (89:1) & protects (12:8) \\
\hline poorly (116:21) & (93:10) (150:12) & (89:15) (126:20) & proud (202:3) \\
\hline (273:17) & (161:4) (164:15) & (126:24) (127:15) & prove (13:8) \\
\hline populated (81:4) & \((171: 2)(196: 20)\) & (135:6) (154:2) (154:9) & provide (18:6)(23:3 \\
\hline portion (18:12) & (209:25) (275:20) & (165:13) (187:15) & \[
(62: 3)(113: 9)(113: 1
\] \\
\hline (23:16) (34:24) (229:2) & prevailing (142:14) & \[
\begin{aligned}
& (190: 12)(190: 13) \\
& (190: 19)(196: 8)
\end{aligned}
\] & \[
\left\lvert\, \begin{array}{cr}
(130: 22) & (132: 14) \\
\text { provided } & (4: 25)
\end{array}\right.
\] \\
\hline \[
\begin{aligned}
& \text { portions }(16: 25) \\
& (208: 21)
\end{aligned}
\] & \begin{tabular}{lr} 
prevent & \((274: 15)\) \\
previous & \((24: 10)\)
\end{tabular} & \[
\begin{aligned}
& (190: 19)(196: 8) \\
& (197: 5)(197: 10)
\end{aligned}
\] & \[
\begin{aligned}
& \text { provided }(4: 25) \\
& (55: 3)(70: 16)(79: 4)
\end{aligned}
\] \\
\hline \(\begin{array}{ll}\text { ports } & (37: 11)(41: 16)\end{array}\) & (85:18) (96:5)(165:3) & (197:11) (200:22) & (86:9) (112:15) \\
\hline position (9:9) & (216:24) & \((213: 4)(242: 12)\) & (130:25) (231:8) \\
\hline \((14: 13)(14: 16)(14: 20)\) & previously (14:2) & \((243: 5)(243: 7)\) & provides (31:25) \\
\hline \((14: 21)(16: 2)(85: 20)\) & (102:16) & (243:10) (243:22) & provision (11:13) \\
\hline \((118: 10)(148: 18)\) & pride (229:12) & (273:18) & (22:23) (69:23) (113:8 \\
\hline (218:25) (257:23) & primarily (46:23) & processed (57:25) & (118:5) (166:21) \\
\hline possibility (75:19) & (77:18)(80:17)(182:10) & processes (192:14) & (199:13) (207:16) \\
\hline (75:20) (172:17) & primary (42:13) & produce (35:20) & (270:10) (278:18) \\
\hline possible (22:5) & (43:19) (44:13) & (177:22) (210:4) & (279:14) (279:17) \\
\hline (73:17) (89:11) (192:7) & (232:19) (270:15) & (210:6) (220:15) & provisions (18:16) \\
\hline (209:18) (255:14) & (270:20) \({ }_{\text {principle }}(155: 7)\) & \begin{tabular}{l}
produced (35:23) \\
(192:7) (216:20)
\end{tabular} & \((23: 10)(24: 6)(50: 6)\)
\((53: 24)(66: 3)(66: 16)\) \\
\hline (257:4) (257:5) (257:6) & principle (155:7) & \[
(192: 7)(216: 20)
\] & \begin{tabular}{l}
(53:24) (66:3) (66:16) \\
(211:10) (239:20)
\end{tabular} \\
\hline (273:2) (276:2) & (270:15) & producing (11:7) & public (12:9) (15: \\
\hline possibly (255:20) & prior (14:22)(43:4) & (73:3)
product
(38:1) & \[
(17: 12)(19: 8)(27: 5)
\] \\
\hline \(\begin{array}{ll}\text { post } & (6: 3)(111: 3) \\ \text { posts } & (206: 14)\end{array}\) & \[
(43: 11)(62: 2)(67: 24)
\]
\[
(80: 1)(85: 20)(100: 24)
\] & production (131:12) & \[
(51: 9)(51: 12)(51: 13)
\] \\
\hline \begin{tabular}{l}
posts (206:14) \\
potential (5:19)
\end{tabular} & \[
(155: 4)(180: 16)
\] & \[
(220: 10)(220: 12)
\] & (68:3) (96:11) (96:13) \\
\hline (192:4)(224:18) & private (120:19) & (220:13) & \[
(101: 6)(104: 1)(111: 9)
\] \\
\hline (255:22) (274:1) & privilege (111:25) & products (38:4)
professional (147:10) & \[
\begin{aligned}
& (112: 21)(127: 9) \\
& (127: 11)(145: 11)
\end{aligned}
\] \\
\hline potentially (152:13) & (112:3) (113:2) & professional (147:10) & \[
(127: 11)(145: 11)
\] \\
\hline pound (87:5) & \((113: 14)(172: 19)\) & profile (281:13) & (145:13) (145:15) \\
\hline pounde (28:4)(28:5) & (172:20) (173:1) & program (1:9)(14:18) & (160:16) (208:14)
\[
(209: 7)(242: 20)
\] \\
\hline power (29:23)(32:24) & prize (5:25) & \[
\begin{aligned}
& (15: 1)(16: 11)(16: 14) \\
& (16: 17)(22: 18)(22: 22)
\end{aligned}
\] & (209:7) (242:20)
\[
(242: 21)(242: 22)
\] \\
\hline \((35: 20)(35: 22)(36: 6)\) & \[
\text { probably } \quad(30: 4)
\] & \[
\begin{aligned}
& (16: 17)(22: 18)(22: 22) \\
& (82: 14)(174: 25)
\end{aligned}
\] & \[
(245: 18)(245: 20)
\] \\
\hline (161:6) & \[
\begin{aligned}
& (31: 7)(34: 6)(35: 7) \\
& (36: 25)(37: 12)(82: 15)
\end{aligned}
\] & \[
\begin{aligned}
& (82: 14)(174: 25) \\
& (201: 20)(201: 24)
\end{aligned}
\] & \[
\begin{aligned}
& (245: 18)(245: 20) \\
& (246: 3)(246: 21)
\end{aligned}
\] \\
\hline \[
\begin{array}{ll}
\text { pp- } & (81: 6) \\
\text { ppb } & (73: 9)(81: 7)
\end{array}
\] & \[
\begin{aligned}
& (36: 25)(37: 12)(82: 15) \\
& (84: 2)(88: 7)(126: 3)
\end{aligned}
\] & \((201: 20)(201: 24)\)
\((202: 1)(202: 3)\) & \[
\begin{aligned}
& (246: 3)(246: 21) \\
& (246: 23)(247: 8)
\end{aligned}
\] \\
\hline (81:11) (83:2) & (143:2) (151:7) & (202:21) (203:9) & (286:6) (286:21) \\
\hline ppd \((81: 6)(81: 8)\) & (159:16) (160:16) & (203:10) (203:21) & publication (228:24) \\
\hline practical (178:17) & (227:15) (248:22) & (203:25) (220:3) & (229:8) \((99.3)(99.7)\) \\
\hline (251:18) (271:10) & (258:22) (271:24) & (228:17) (228:21) & publicly (99:3)(99:7) \\
\hline (271:19) & problem (49:19) & (228:24) (257:24) & pulls (207:8) \\
\hline practice (278:6) & (80:14) (118:22) & (258:1) (258:8) & punitive (123:5) \\
\hline practices (128:6) & \((118: 24)(121: 15)\) & programs (18:15) & purpose (43:19) \\
\hline
\end{tabular}
\begin{tabular}{|c|c|c|c|}
\hline (113:8) (232:19) & \((184: 1)(184: 12)\) & (105:7) (271:4) (271:6) & (120:14) (123:10) \\
\hline purposes (98:24) & \[
(184: 13)(186: 25)
\] & rapid (223:11) & \((123: 20)(123: 23)\) \\
\hline (189:11) (189:17) & \((198: 21)(199: 17)\) & (225:10) & \((123: 25)(141: 9)\) \\
\hline pursuant (207:17) & (203:18) (210:21) & rarely (183:14) & \((153: 5)(155: 25)\) \\
\hline (286:7) & (210:23) (211:20) & rate (33:19) (106:25) & \((164: 24)(180: 5)\) \\
\hline push (11:23)(39:15) & (212:6) (212:7) & (107:10) (111:12) & \((180: 8)(180: 21)\) \\
\hline (39:16) (41:11) (41:17) & \((212: 13)(212: 24)\) & (118:25) (119:2) & \((183: 1)(186: 17)\) \\
\hline \((41: 22)(45: 14)(45: 18)\) & (213:6) (213:11) & (120:15) (121:11) & \((186: 23)(188: 6)\) \\
\hline \((167: 16)(167: 21)\) & (214:25) (239:10) & (121:12) (121:22) & (188:7) (203:20) \\
\hline (194:3) & (253:11) & (171:6) & (204:1) (222:8) \\
\hline pushed (34:14)(94:5) & quarterly (182:15) & rates (49:7) & (222:11) (222:13) \\
\hline (193:16) (193:19) & (182:16) (183:2) & rather (204:7) & (245:19) (251:9) \\
\hline (221:13) (227:15) & \((183: 24)(185: 17)\) & 工aw (40:5)(40:6) & (259:3) (266:23) \\
\hline pushes (38:25)(39:2) & \((185: 24)(198: 22)\) & (57:24) (168:14) & (266:24) (266:25) \\
\hline pushing (45:17) & (199:6) (210:22) & \((224: 22)(225: 6)\) & receive (70:24) \\
\hline \((45: 19)(55: 7)(59: 23)\) & (211:21) & (270:21) (270:22) & (71:1) (147:15) \\
\hline \((60: 9)(60: 12)(85: 4)\) & quarters (7:16) & (271:3) (282:6) & (147:18) (242:21) \\
\hline \((94: 1)(94: 8)(94: 9)\) & (48:8) (52:4) (68:14) & re- (74:1) & received (70:8) \\
\hline (94:10) (94:11) (94:15) & (98:2) (99:21) (100:9) & reach (34:25)(35:3) & (86:19) (146:22) \\
\hline \((107: 19)(211: 6)\) & \((101: 24)(102: 11)\) & (54:20) (172:21) & \((147: 10)(147: 24)\) \\
\hline \((238: 3)(239: 16)\) & (104:6) (159:1) (159:3) & (273:4) (274:3) & \((185: 23)(186: 20)\) \\
\hline (268:18) & \((162: 17)(162: 22)\) & reaching (113:10) & (205:25) (227:4) \\
\hline puts (226:1)(236:15) & \((170: 2)(199: 11)\) & (274:15) & \[
(251: 23)
\] \\
\hline \(Q\) & quench \((39: 8)(39: 10)\) & reactive (81:24) & recent (71:10) \\
\hline quali- (89:16) & quenched (39:8) & (82:2) 74.10\()\) & \[
(71: 15)(129: 22)
\] \\
\hline qualified (286:6) & question (9:13) & reacts (74:10) & (144:4) (164:23)
\[
(205: 11)
\] \\
\hline qualify (47:12) & \((21: 8)(60: 2)(70: 17)\) & (74:12) (82:3) & \[
\begin{aligned}
& \text { (205:11) } \\
& \text { recently } \quad(27: 22)
\end{aligned}
\] \\
\hline (82:11) (165:3) & \((86: 1)(103: 19)\)
\((109: 19)(111: 14)\) & read \((33: 10)(47: 6)\)
\((58: 3)(69: 19)(116: 9)\) & \[
\begin{array}{|l}
\text { recently } \quad(27: 22) \\
(27: 23)(240: 7)
\end{array}
\] \\
\hline quality (1:8)(6:15)
\((7: 25)(9: 1)(14: 18)\) & \((109: 19)(111: 14)\)
\((111: 17)(114: 4)\) & \[
(159: 19)(164: 22)
\] & re-certified (136:3) \\
\hline \((16: 3)(16: 10)(16: 11)\) & (124:1) (125:3) (125:9) & (199:1) (207:12) & recessed (78:21) \\
\hline \((16: 17)(19: 2)(19: 7)\) & \((125: 22)(129: 16)\) & (207:24) (211:1) & \((173: 10)(234: 20)\) \\
\hline \((21: 16)(22: 18)(23: 8)\) & \((130: 8)(130: 15)\) & (221:8) (221:20) & (285:17) \\
\hline \((47: 6)(55: 23)(71: 8)\) & \((132: 13)(141: 2)\) & (221:23) (225:8) & recession (210:3) \\
\hline \((71: 11)(71: 16)(89: 8)\) & (244:23) (244:24) & (227:6) (229:2) & (220:9) \\
\hline \((89: 20)(97: 17)(97: 20)\) & (257:25) (260:12) & (231:13) (245:6) & recollection (51:15) \\
\hline \((141: 8)(159: 8)\) & \((261: 14)(261: 19)\) & (252:24) (261:25) & (53:25) (55:10) (79:25) \\
\hline \((161: 12)(174: 25)\) & (261:22) (273:7) & \((264: 23)(276: 5)(278: 7)\) & (124:24) (182:14) \\
\hline \((178: 12)(202: 22)\) & \((274: 6)(284: 6)\) & reading (33:15) & (197:8) (201:24) (222:8) \\
\hline (202:23) (208:7) & questioned (123:8) & (49:25) (50:1) (63:8) & recollections \\
\hline \((220: 3)(245: 9)(249: 2)\) & (123:14) (123:15) & \((64: 18)(74: 18)(83: 1)\) & recommendations \\
\hline \((257: 24)(258: 1)\) & \((123: 18)(123: 21)\) & (83:24) (121:6) & reconvened (78:22) \\
\hline \((258: 7)(258: 8)\) & (125:11) (125:13) & (124:20) (191:13) & (173:11) (234:21) \\
\hline (268:14) (273:17) & questioning (123:23) & (208:24) & record (8:7)(13:18) \\
\hline \((273: 20)(275: 9)\) & questions (56:3) & readings (81:4) & \((13: 20)(13: 22)(14: 6)\) \\
\hline \((276: 17)(276: 25)\) & \((90: 4)(90: 6)(90: 9)\) & (281:18) & \[
(16: 8)(18: 25)(36: 19)
\] \\
\hline (277:3) & (120:25) (130:23) & real (33:2)(177:12) & \[
\begin{aligned}
& (51: 23)(78: 24)(91: 8) \\
& (140: 13)(166: 10)
\end{aligned}
\] \\
\hline quantifying (280:17) & \[
(131: 6)(168: 15)
\] & \[
(196: 25)
\] & \[
\begin{aligned}
& (140: 13)(166: 10) \\
& (173: 13)(173: 22)
\end{aligned}
\] \\
\hline (280:20) (89. & \[
\begin{aligned}
& (173: 4)(173: 7) \\
& (234: 14)(234: 16)
\end{aligned}
\] & \begin{tabular}{l}
realistically \\
reality (16:13)
\end{tabular} & \[
\begin{aligned}
& (173: 13)(173: 22) \\
& (188: 9)(217: 15)
\end{aligned}
\] \\
\hline \[
(176: 23)(177: 14)
\] & \((234: 24)(282: 11)\) & (117:20) & (218:23) (224:5) \\
\hline quantity and (89:20) & (285:5) & realize (129:13) & (227:6) (234:23) \\
\hline quarter (48:9) & quick (201:2)(234:19) & (129:15) & \((263: 20)(264: 6)\) \\
\hline \((51: 24)(51: 25)(52: 2)\) & quickly (32:4) & realized (149:15) & \[
(285: 10)(285: 16)
\] \\
\hline \((54: 4)(54: 6)(54: 9)\) & \[
(73: 23)(74: 11)(74: 12)
\] & \[
(189: 20)
\] & \[
\begin{aligned}
& (286: 9) \\
& \text { recorded (252:11) }
\end{aligned}
\] \\
\hline \((54: 10)(54: 11)(54: 12)\)
\((98: 4)(98: 8)(98: 10)\) & \[
\text { quite }(66: 17)(73: 10)
\] & \[
\begin{aligned}
& \text { reason }(22: 12)(27: 8) \\
& (27: 10)(34: 8)(37: 18)
\end{aligned}
\] & \[
\begin{aligned}
& \text { recorded } \quad(252: 11) \\
& (252: 13)
\end{aligned}
\] \\
\hline \((98: 4)(98: 8)(98: 10)\)
\((98: 11)(98: 14)(98: 16)\) & (157:22) (193:24)
\((196: 21)(197: 9)\) & \[
(137: 23)(239: 24)
\] & recording (95:9) \\
\hline \((98: 17)(98: 20)(99: 21)\) & \((213: 5)(253: 1)\) & reasonable (8:14) & (95:11) \\
\hline \((102: 14)(103: 2)\) & quote (279:3) & \((13: 9)(70: 3)(127: 25)\) & records (53:9) \\
\hline (103:5) (103:8) & \(\mathbf{R}\) & (129:7) (9.12) & \[
(250: 20)
\] \\
\hline (103:12) (103:13) & R & reasonably (9:12) &  \\
\hline (103:21) (103:23) & & \[
(26: 9)(130: 3)(208: 13)
\] & recross (168:16)
\((282: 13)\) \\
\hline (104:9) (104:15) & raise \((5: 16)(5: 17)\) & \begin{tabular}{l}
reasons (132:4) \\
(132:10) (169:15)
\end{tabular} & \begin{tabular}{l}
\[
(282: 13)
\] \\
recross-examination
\end{tabular} \\
\hline (107:11) (108:22) & \[
(160: 16)
\] & \[
\begin{aligned}
& (132: 10)(169: 15) \\
& (169: 17)
\end{aligned}
\] & recross-examination redirect (3:4)(3:5) \\
\hline \((108: 24)(109: 1)\) & \begin{tabular}{l}
raised (24:20) \\
raises (111:14)
\end{tabular} & \[
\begin{aligned}
& \text { (169:17) } \\
& \text { rebuild } \quad(275: 21)
\end{aligned}
\] & \[
(3: 8)(3: 9)(154: 23)
\] \\
\hline \((157: 16)(162: 10)\)
\((162: 15)(163: 5)\) & (114:4) (170:9) & recall (55:25) & (155:1) (269:20) \\
\hline (169:5) (170:12) & ran (96:4) & \((79: 25)(80: 12)(84: 6)\) & \((269: 23)(284: 8)\) \\
\hline \((170: 17)(183: 1)\) & range (102:20) & \((97: 1)(98: 23)(114: 7)\) & redirect-examination \\
\hline
\end{tabular}
\begin{tabular}{|c|c|c|c|}
\hline reduce (7:19)(26:19) & (191:3) (201:12) & (228:25) (244:3) & \[
(51: 18)(53: 1)(53: 14)
\] \\
\hline (51:8) (63:5) (199:13) & (202:13) (242:12) & (244:6) (244:14) & \((107: 5)(132: 17)\) \\
\hline reduced (63:7)(96:6) & (242:14) (242:17) & (246:8) (247:9) & (161:14) (203:18) \\
\hline (215:2) (286:8) & (242:21) (243:1) & (248:17) (258:17) & (208:25) \\
\hline reduces (28:25) & (243:4) (243:9) & (259:14) & requirements (11:4) \\
\hline reducing (184:4) & (243:10) (250:21) & remember just (260:2) & \((15: 7)(15: 9)(26: 13)\) \\
\hline reduction (183:12) & (251:13) (251:15) & remind (224:1) & \((26: 19)(53: 1)(54: 19)\) \\
\hline (183:14) (183:19) & (252:22) (252:25) & removal (186:15) & \((60: 18)(60: 22)(63: 15)\) \\
\hline (184:8) (200:5) & (253:2) & remove (185:7) & \((63: 17)(63: 18)(68: 2)\) \\
\hline (200:10) (229:3) & regulations (6:15) & (217:15) (217:23) & \((118: 15)(187: 24)\) \\
\hline reductions (28:18) & \((6: 25)(7: 11)(9: 14)\) & removing (185:10) & (201:11) (208:11) \\
\hline (199:18) & \((9: 15)(9: 16)(9: 19)\) & renamed (203:7) & (211:6) (235:17) \\
\hline refer (203:25) & \((9: 23)(11: 25)(12: 2)\) & re-negotiated & (239:16) (241:20) \\
\hline (218:23) (235:12) & \((12: 3)(12: 5)(12: 11)\) & re-opening (69:14) & (241:24) (250:4) \\
\hline (284:17) & \((23: 4)(23: 6)(23: 7)\) & reorient (114:3) & (250:15) (250:16) \\
\hline reference (114:20) & (23:9) (24:12) (26:12) & repair (182:20) & (261:17) (269:4) \\
\hline (115:9) (201:11) & \((26: 19)(28: 24)(88: 15)\) & (248:7) (248:11) & (269:5) (278:22) \\
\hline (203:23) & (91:17) (91:19) (91:20) & repairs (247:10) & requires (26:2) \\
\hline referenced (133:6) & \((91: 23)(92: 2)(92: 4)\) & (247:15) (247:24) & \((26: 16)(26: 23)(49: 4)\) \\
\hline references (279:11) & \((92: 11)(92: 16)\) & repeat (68:3)(68:5) & \((49: 17)(50: 18)(50: 19)\) \\
\hline referred (245:23) & \((135: 13)(136: 9)\) & (68:11) (162:13) & (93:4) (136:11) \\
\hline referring (39:14) & (153:5) (153:10) & repeated (48:11) & requiring (53:19) \\
\hline (183:22) (247:23) & (153:19) (154:19) & (68:8) (223:10) & (161:19) \\
\hline (265:4) (284:12) & \((165: 5)(182: 6)\) & (225:18) (225:20) & research (230:17) \\
\hline (284:22) & (187:14) (187:22) & repeatedly (151:8) & reserve (172:16) \\
\hline reflect (87:16) & \((187: 23)(188: 6)\) & repeating (68:14) & resolution (8:18) \\
\hline refresh (124:24) & (201:13) (201:14) & rephrase (270:1) & resolve (70:2)(70 \\
\hline regard (44:20)(270:4) & (206:19) (235:4) & replace (195:19) & (252:6) (253:3) \\
\hline regarding (70:5) & (235:6) (235:9) & (195:22) (195:23) & resort (11:7) \\
\hline \((91: 10)(185: 3)(211: 5)\) & \((235: 10)(235: 13)\) & replaced (195:17) & respect (6:14)(7:8) \\
\hline \((211: 6)(211: 23)\) & (235:14) (236:13) & (195:20) & (7:21) (24:3) (24:21) \\
\hline \((229: 2)(239: 15)\) & \((242: 10)(249: 8)\) & report (4:22)(4:24) & (26:1) \((27: 17)(29: 13)\) \\
\hline (239:16) & \((249: 20)(273: 1)\) & \((17: 20)(60: 13)(71: 10)\) & \((31: 9)(44: 2)(46: 20)\) \\
\hline regardless (17:12 & (273:11) (284:18) & (73:13) (201:6) & \((48: 25)(53: 23)(69: 21)\) \\
\hline (30:22) (113:9) & (284:20) (285:2) & (225:23) (228:16) & \((70: 14)(70: 21)(71: 18)\) \\
\hline region (20:9)(22:5) & regulatory (15:2) & (228:19) (231:4) & \((76: 16)(80: 8)(80: 25)\) \\
\hline (75:1) (77:15) & \((16: 9)(68: 17)(127: 3)\) & reporter (4:25) & \((82: 20)(85: 10)(96: 18)\) \\
\hline regional (72:18) & \((155: 20)(156: 11)\) & (5:20) (111:3) (173:17) & \((113: 3)(157: 2)\) \\
\hline (72:20)(159:12) (160:9) & (181:9) & (286:1) & (157:15) (161:13) \\
\hline regionally (47:16) & reject (206:21) & reporters (1:23) & (164:20) (165:1) \\
\hline register (165:6) & relate (83:17) & reporting (184:23) & (165:16) (175:15) \\
\hline regular (136:3) & (118:15) (187:11) & (184:25) (185:2) & \((179: 3)(180: 20)\) \\
\hline (151:16) (196:21) & related (36:14) & \((185: 5)(186: 3)(201: 5)\) & \((184: 1)(185: 25)\) \\
\hline (207:8) & \((115: 16)(146: 22)\) & (215:8) & (186:13) (187:6) \\
\hline regularly (182:18) & (265:9) (286:10) & reports (185:17) & (191:11) (194:6) \\
\hline (185:10) & relates (82:18) & (185:21) (185:24) & (196:16) (201:8) \\
\hline regulate (126:14) & (85:23)(118:11) & (222:9) & (201:9) (205:22) \\
\hline (154:15) (154:18) & \((136: 20)(143: 18)\) & represent (30:16) & (216:2) (222:9) (223:2) \\
\hline (257:10) & \((199: 10)(218: 11)\) & (171:25) (265:18) & (229:10) (231:24) \\
\hline regulated (99:8) & \((237: 3)(239: 9)(240: 19)\) & representation & (241:9) (242:5) \\
\hline (99:12) (101:6) & relating (172:25) & representative & (248:13) (270:1) \\
\hline regulates (154:13) & (208:12) & represents (144:19) & \((270: 3)(270: 8)\) \\
\hline regulation (27:3) & relation (84:23) & (167:12) (219:25) & (270:16) (271:7) \\
\hline \((50: 18)(50: 19)(67: 11)\) & relations (112:21) & request (24:7) & \((271: 21)(272: 6)\) \\
\hline \((67: 20)(78: 8)(88: 16)\) & (180:2) & (131:12) (133:7) & (273:4) (273:13) \\
\hline \((89: 25)(95: 14)\) & relative (33:18) & requested (48:5) & \((274: 17)(276: 25)\) \\
\hline \((126: 21)(127: 20)\) & (143:1) (286:11) & requesting (70:1) & \((277: 12)(277: 21)\) \\
\hline \((127: 25)(145: 24)\) & relatively (57:21) & requests (131:18) & (279:17) (280:17) \\
\hline (146:2)(146:18) & (65:12) & (245:14) (245:18) & \[
(281: 13)
\] \\
\hline (146:23) (155:8) & released (194:5) & (245:20) & respiratory (44:7) \\
\hline (155:9) (164:5) & relevant (233:16) & require (17:18) & (44:14) (225:14) \\
\hline \((164: 16)(164: 20)\) & reliable (10:11) & (24:18) (26:8) (161:16) & respond (16:19) \\
\hline \((165: 12)(165: 22)\) & reliably (135:7) & (230:1) (252:22) & (117:19) (130:15) \\
\hline \((166: 5)(166: 6)\) & remain (43:6)(59:18) & required (17:10) & (242:23) \\
\hline \((166: 16)(167: 20)\) & remaining (57:15) & (19:17) (24:11) (53:5) & responded (132:20) \\
\hline \((187: 7)(187: 17)\) & remedies (62:21) & (76:3) (76:4) (78:8) & responding (15:7) \\
\hline \((188: 14)(189: 6)\) & (207:5) (275:10) & \((166: 3)(185: 6)(201: 6)\) & responds (30:20) \\
\hline \((189: 24)(189: 25)\) & remedy (55:16) & (255:15) (272:8) & (112:21) \\
\hline \((190: 1)(190: 9)\) & (157:15) & (278:21) (279:2) & response (25:2) \\
\hline \((190: 17)(190: 18)\) & remember (57:11) & requirement (11:2) & \[
(30: 25)(86: 8)(112: 6)
\] \\
\hline \((190: 20)(190: 22)\) & \((78: 6)(145: 7)(163: 12)\) & \((17: 22)(18: 5)(25: 15)\) & (112:18) (112:23) \\
\hline
\end{tabular}

\begin{tabular}{|c|c|c|c|}
\hline \multicolumn{2}{|l|}{show} & \multicolumn{2}{|r|}{sometimes} \\
\hline (41:14)(41:21) (58:2) & (152:16) (159:7) & (121:24) (123:11) & (217:6) (217:17) \\
\hline \((59: 10)(188: 21)(224: 9)\) & \((184: 23)(193: 8)\) & (123:19) (124:6) & \((217: 20)(217: 24)\) \\
\hline show \((17: 24)(18: 22)\) & \((194: 4)(200: 9)\) & \((125: 8)(126: 6)\) & (218:2) (218:5) (219:1) \\
\hline \((30: 21)(49: 7)(54: 17)\) & (224:23) (256:12) & \((128: 20)(129: 12)\) & (219:5) (219:8) \\
\hline \((79: 4)(83: 5)(122: 5)\) & (256:16) (256:19) & (141:12) (154:25) & (219:11) (219:14) \\
\hline \((132: 16)(157: 9)\) & (256:23) (265:12) & sister (6:9)(223: & (219:18) (223:22) \\
\hline (166:7) (199:16) & (266:13)(266:25) \({ }^{\text {( }}\) ( 22.8\()\) & \[
(224: 13)
\] & \[
\begin{aligned}
& (223: 25)(224: 8) \\
& (227: 24)(228: 3)
\end{aligned}
\] \\
\hline \((227: 21)(241: 14)\)
\((241: 15)(255: 17)\) & \[
\begin{aligned}
& \text { significantly (82:8) } \\
& (82: 10)(96: 1)(102: 7)
\end{aligned}
\] & \[
\begin{aligned}
& \text { site }(21: 14)(265: 13) \\
& (266: 14)(267: 1)
\end{aligned}
\] & \[
\begin{aligned}
& (227: 24)(228: 3) \\
& (228: 6)(229: 17)
\end{aligned}
\] \\
\hline \((241: 15)(255: 17)\)
\((259: 3)(277: 7)\) & \[
(102: 15)(102: 17)
\] & sites (21:5)(21:6) & (229:20) (230:3) \\
\hline showed (259:1) & (104:20) (151:17) & (72:7) & (230:7) (230:11) \\
\hline showing (30:25) & \((191: 6)(208: 6)(268: 24)\) & sitting (22:2) & (233:4) (233:13) \\
\hline (54:14) (60:15) (68:2) & signing (118:9) & situation (26:11) & (233:24) (234:6) \\
\hline (86:10) & sim (33:23) & (49:10) (117:19) & :14) (234:18) \\
\hline shown (121:22) & similar (205:18) & (153:1) (229:22) & \((234: 22)(269: 20)\) \\
\hline (159:24)(224:15) & (220:18) (278:14) & (273:14) \({ }^{\text {situations }}\) (26:10) & \[
\begin{aligned}
& (282: 12)(282: 15) \\
& (284: 5)(284: 7)(285: 4
\end{aligned}
\] \\
\hline shows (12:23)(29:4) & \[
\left\lvert\, \begin{array}{lr}
(278: 18) \\
\text { similarly } & \text { (186:13) }
\end{array}\right.
\] & situations (26:10)
(99:4) & \[
\begin{aligned}
& (284: 5)(284: 7)(285: 4 \\
& (285: 6)(285: 8)
\end{aligned}
\] \\
\hline \[
\begin{aligned}
& (47: 2)(55: 8)(71: 17) \\
& (81: 17)(122: 6)
\end{aligned}
\] & \[
\begin{aligned}
& \text { similarly (186:13) } \\
& (207: 24)(211: 22)
\end{aligned}
\] & \[
\text { six }(12: 16)(19: 3)
\] & \[
\begin{aligned}
& (285: 6)(285: 8) \\
& (285: 12)(285: 15)
\end{aligned}
\] \\
\hline (129:10) (137:19) & (212:14) & \((19: 6)(53: 16)(66: 10)\) & slice (37:3)(37:8) \\
\hline \((141: 14)(142: 8)\) & simple (109:19) & \((133: 22)(134: 8)\) & (58:12) (58:14) \\
\hline \((144: 8)(144: 11)\) & simplicity (189:11) & \((136: 1)(143: 23)\) & slices (94:3) \\
\hline (148:6) (156:3) & (189:17) & \((160: 21)(163: 1)\) & sliding (160:8) \\
\hline (161:11) (167:19) & simplified (189:7) & \((176: 4)(213: 18)\) & slightly (108:15) \\
\hline \((167: 23)(249: 4)\) & simplistic (272:3) & (215:17) (217:25) & (216:14) (222:7) \\
\hline shut (51:15) (83:25) & simply (177:21) & (218:1) (218:2) (278:5) & slowly (224:1) \\
\hline (199:23) (220:4) & (189:10) (273:22) & (278:18)(278:21) & small (160:5) \\
\hline (220:19) (238:22) & simulation (29:11) & six-month (133:24) & \[
(193: 13)(270: 6)
\] \\
\hline (238:24) & since (14:14)(18:19) & (134:2) \({ }^{\text {a }}\) (122.3) & \begin{tabular}{l}
smaller (20:13) \\
(29:20) (204:23)
\end{tabular} \\
\hline shutdown (199:19) & (19:9) (22:10) (49:17) & sixty (122:3) & \[
\text { smell }(42: 21)(75: 11)
\] \\
\hline (199:20) (207:20) & \((60: 15)(64: 8)(121: 22)\)
\((122: 23)(124: 23)\) & sixty-three (106:4)
\[
(106: 14)(106: 15)
\] & \[
(86: 21)(227: 10)
\] \\
\hline \((208: 18)(209: 15)\)
\((209: 17)(209: 18)\) & \((122: 23)(124: 23)\)
\((160: 11)(166: 25)\) & (106:14)(106:15)
size (20:14)(84:24) & \[
(227: 14)(251: 8)
\] \\
\hline (209:19) (209:22) & \((167: 15)(169: 21)\) & (85:1) & smells (248:15) \\
\hline (209:23) (275:16) & \((183: 16)(187: 3)\) & sized (205:18) & smoke (30:9)(32:4) \\
\hline (275:17) (276:7) & \((190: 11)(218: 20)\) & skin (225:12) & \((32: 5)(33: 12)(39: 5)\) \\
\hline shutting (200:17) & \((243: 17)(245: 3)\) & slater ( \(1: 17)(5: 2)\) & \[
(42: 6)(58: 22)(89: 12)
\] \\
\hline \((227: 20)\) & (279:11) \({ }^{\text {a }}\) ( 2.17\()(73.2)\) & \[
\begin{aligned}
& (5: 11)(5: 15)(5: 21) \\
& (8: 21)(13: 10)(13: 12)
\end{aligned}
\] & \[
\begin{aligned}
& (178: 8)(178: 9)(271: 15) \\
& \text { so- }(44: 8)
\end{aligned}
\] \\
\hline sic (33:14)(79:5) & single (9:17)(73:2) & \begin{tabular}{l}
\((8: 21)(13: 10)(13: 12)\) \\
(13:15) (13:17) (13:21)
\end{tabular} & soaking (40:17) \\
\hline (99:25) \({ }^{\text {a }}\) (11.19) (11:23) & \[
\begin{aligned}
& (112: 6)(112: 10) \\
& (112: 19)(160: 2)
\end{aligned}
\] & \begin{tabular}{l}
(13:15) (13:17) (13:21) \\
\((16: 8)(18: 25)(36: 19)\)
\end{tabular} & \[
(41: 8)(41: 10)(41: 22)
\] \\
\hline side (11:19)(11:23)
\((12: 15)(13: 2)(13: 5)\) & \((112: 19)(160: 2)\)
\((167: 21)\) & \[
\begin{aligned}
& (16: 8)(18: 25)(36: 19) \\
& (36: 22)(39: 13)(39: 18)
\end{aligned}
\] & \[
(60: 9)(93: 25)(94: 16)
\] \\
\hline \((38: 24)(39: 22)(41: 25)\) & sip (22:6)(22:8) & \((39: 20)(39: 24)(44: 9)\) & (107:23) (211:8) \\
\hline \((45: 4)(45: 16)(48: 25)\) & \((22: 22)(23: 5)(24: 1)\) & \((56: 2)(56: 9)(58: 12)\) & (238:5) (239:18) \\
\hline \((50: 6)(50: 13)(50: 15)\) & \((24: 10)(26: 1)(26: 2)\) & (62:9) (62:12) (78:11) & sodium (7:22) \\
\hline \((50: 17)(50: 23)(97: 12)\) & \((28: 13)(29: 16)(29: 21)\) & \((78: 14)(78: 18)(78: 23)\) & solicitor (65:12) \\
\hline \((133: 21)(142: 11)\) & \((30: 10)(31: 13)(31: 14)\) & \((84: 15)(84: 17)(90: 5)\) & (65:25) \\
\hline \((164: 21)(166: 3)\) & \((31: 15)(31: 16)(88: 11)\) & \((90: 8)(90: 14)(90: 16)\) & solid (59:9) (158:5) \\
\hline \((166: 14)(167: 5)\) & (89:1) (175:18) & (90:21) (91:1) (91:4) & somebody (86:15) \\
\hline \((167: 12)(167: 16)\) & \((175: 20)(175: 23)\) & \((91: 12)(91: 13)(94: 3)\) & (120:22) (189:15) \\
\hline \((167: 21)(167: 22)\) & (196:5) (206:17) & \((97: 6)(97: 9)(106: 12)\) & (250:23) \\
\hline \((167: 24)(170: 20)\) & \((206: 18)(206: 22)\) & \((106: 15)(112: 17)\) & someone (154:2) \\
\hline \((194: 15)(194: 19)\) & (207:3) (207:6) & (113:12) (113:13) & (177:9) \\
\hline (257:15) (257:18) & \((207: 11)(208: 21)\) & (113:15) (113:19) & someplace (252:2) \\
\hline sided (216:22) & \((235: 12)(235: 14)\) & (116:15) (119:13) & something (9:1) \\
\hline sides (74:16)(194:8) & (241:1) (241:19) & \((119: 19)(119: 21)\) & \((29: 18)(33: 23)(38: 6)\) \\
\hline (194:10) (194:13) & (241:24) (242:3) & (119:24) (125:25) & (48:23) (49:2) (49:4) \\
\hline (194:22) & (242:9) (243:23) & (126:2) (129:18) & \((49: 13)(49: 14)(55: 9)\) \\
\hline sign (102:9) & (244:2) (254:5) & (131:15) (131:21) & (62:21) (66:19) (76:4) \\
\hline signature (66:24) & \((260: 16)(272: 6)\) & (141:18) (154:23) & \[
(82: 13)(82: 16)(110: 4)
\] \\
\hline \((66: 25)(243: 3)\) & (272:7) (272:8) & (168:16) (172:4) & (110:7) (121:2) \\
\hline signed (47:22) & (272:18) (273:11) & (172:11) (172:22) & (147:11) (152:16) \\
\hline (62:18) (102:8) & (273:24) (279:20) & (173:3) (173:6) (173:8) & \[
(161: 22)(169: 3)
\] \\
\hline (109:11) (109:14) & (280:2) (281:9) (282:18) & (173:12) (188:9) & (177:9) (183:13) \\
\hline (109:21) (140:19) & siped (206:15) & (188:23) (189:2) & (185:12) (194:19) \\
\hline (180:18) (210:20) & (206:24) (207:10) & (206:8) (210:9) & (218:22) (265:18) \\
\hline significance (20:13) & sir (25:24)(62:11) & (210:12) (213:19) & \[
(281: 1)(282: 4)
\] \\
\hline significant (11:9) & \((90: 15)(101: 15)\) & (213:21) (213:23) &  \\
\hline \((73: 7)(80: 10)(81: 17)\) & (102:8) (103:19) & (213:25) (214:12) & sometimes (30:20) \\
\hline (86:12) (109:17) & (109:19) (110:14) & (214:15) (215:11) & (158:4) (178:17)
\[
(199: 3)(199: 5)(235: 5)
\] \\
\hline \((143: 4)(150: 25)\) & \((116: 11)(120: 2)\) & \((215: 14)(215: 16)\) & \((199: 3)(199: 5)(235: 5)\) \\
\hline
\end{tabular}
\begin{tabular}{|c|c|c|c|}
\hline \multicolumn{2}{|l|}{somewhat} & \multicolumn{2}{|r|}{statement} \\
\hline (235:9) (242:9) (242:14) & space (46:15)(193:13) & stacks (32:18)(33:1) & \((16: 24)(17: 11)(17: 12)\) \\
\hline somewhat (64:16) & speak (79:2) (84:12) & (34:8)(34:12)(57:8) & \((17: 13)(17: 18)\) \\
\hline (64:17) (178:3) & (224:1) & (57:22) (94:18) (95:5) & \((18: 23)(20: 1)(21\) \\
\hline somewhere (22:3) & speaking (191:11) & (114:25) (115:14) & (21:15) \\
\hline (57:19) (143:11) & special (13:3)(175:4) & (115:17) (118:16) & (25:6) \\
\hline soon (147:23) & specialty (174:13) & (120:10) (123:9) &  \\
\hline sorry (21:24)(22:1) & apecific (20:1) & \((124: 23)(125: 10)\)
\((211: 7)(239: 17)\) & \[
(153: 8)(153: 24)
\] \\
\hline \((32: 3)(44: 11)(58: 13)\) & \((23: 10)(26: 24)(28: 11)\)
\((48: 24)(49: 6)(51: 19)\) & \[
\begin{aligned}
& (211: 7)(239: 17) \\
& (248: 5)(248: 9)
\end{aligned}
\] & \[
(182: 11)(182: 12)
\] \\
\hline \((60: 1)(67: 7)(77: 23)\)
\((82: 23)(89: 3)(119: 21)\) & \((48: 24)(49: 6)(51: 19)\)
\((61: 5)(66: 3)(72: 16)\) & \((248: 5)(248: 9)\)
\((264: 22)(265: 1)\) & \[
(201: 19)(254: 12)
\] \\
\hline \((155: 19)(163: 16)\) & \((73: 1)(73: 25)(87: 13)\) & \((265: 4)(265: 9)(267: 6)\) & (254:15) (278:6) \\
\hline \((166: 10)(167: 9)\) & \((88: 8)(94: 15)(94: 16)\) & (268:5) (268:10) & (279:12) (283:14) \\
\hline \((171: 14)(204: 16)\) & (94:23) (96:10) & (268:17) (269:5) & (283:17) (283:22) \\
\hline (214:5) (219:13) & (114:19) (126:13) & staff (55:11)(55:12) & (284:2) (284:11) \\
\hline (223:23) & (150:13) (161:21) & (55:13) (55:15) (121:1) & (284:13) (284:15) \\
\hline sort (32:21)(66:21) & (174:19) (176:16) & (140:22) (164:1) & (284:25) (285:1) \\
\hline (179:7) (187:20) & (197:16) (201:13) & \((175: 6)(175: 7)\) & stand-in (33:22) \\
\hline (187:21) (193:5) & (230:17) (244:25) & stand (10:19) (153:7) & (33:24) \\
\hline (272:2) (274:5) (280:16) & (284:24) & (187:17) &  \\
\hline sound \((59: 14)(169: 11)\) & specifically (20:4) & atandard (11:18)
\[
(12: 13)(12: 14)(12: 21)
\] &  \\
\hline sounds \(\quad(193: 15)\)
\((197: 3)(200: 1)(2)\) & \((26: 15)(46: 21)(46: 24)\)
\((78: 2)(84: 8)(84: 9)\) & \((12: 13)(12: 14)(12: 21)\)
\((12: 22)(17: 4)(17: 6)\) & \[
\text { start }(5: 7)(5: 23)
\] \\
\hline source (50:10) & \((86: 1)(107: 2)(114: 14)\) & \((17: 21)(18: 20)(18: 21)\) & (29:17) (31:14) (31:15) \\
\hline (50:11) (50:12) (72:16) & \((131: 13)(153: 11)\) & \((19: 3)(19: 6)(19: 7)\) & (37:20) (58:21) (61:24) \\
\hline \((72: 25)(73: 2)(73: 25)\) & (194:24) (202:6) & (19:11) (19:17) (19:18) & \((110: 15)(150: 1)\) \\
\hline \((74: 15)(74: 22)(74: 23)\) & (203:23) (204:4) & \((19: 19)(19: 20)(20: 7)\) & (150:17) (175:5) \\
\hline \((146: 7)(146: 9)\) & (211:5) (211:12) & (21:1) (21:3) (24:22) & (221:5) (221:21) \\
\hline \((146: 14)(160: 3)\) & (222:23) (223:13) & (24:23) (25:8) (25:10) & (224:6) (224:8) (2) \\
\hline \((164: 3)(164: 10)\) & \((239: 15)(240: 19)\) & \((25: 21)(27: 1)(27: 5)\) & (230:5) (260:11) \\
\hline (164:19) (165:2) & \((241: 18)(245: 5)\) & \((27: 12)(29: 4)(29: 10)\) & (274:19) (274:23) \\
\hline (166:21) (187:6) & (248:19) (259:17) & \((47: 21)(49: 1)(51: 23)\) & started (64:10) \\
\hline (187:11) (187:18) & (270:8) (270:11) & (51:24) (72:11) (72:12) & (66:14) (66:15)( \\
\hline \((188: 5)(189: 7)\) & (284:12) (284:14) & (72:24) (72:25) (73:4) & (98:20) (98:22) (1) \\
\hline (189:12) (190:8) & (284:22) & (73:25) (76:24) (76:25) & (103:12) (103:13) \\
\hline \((190: 13)(190: 16)\) & specification (49:18) & \((77: 3)(87: 19)(87: 22)\) & (103:21) (103:23) \\
\hline (190:19) (190:21) & specifics (196:25) & \((93: 12)(93: 16)(95: 13)\) & (104:7) (104:10) \\
\hline \((191: 2)(191: 10)\) & specifies (28:7) & (116:23) (116:25) &  \\
\hline (207:15) (207:18) & specify (166:11) & (118:18) (118:19) & \begin{tabular}{l}
(274:21) \\
starting (47:10)
\end{tabular} \\
\hline (207:20) (208:6) & speculation (50:4) & \[
(118: 22)(121: 22)
\] & \begin{tabular}{l}
starting (47:10) \\
(47:11) (68:12) (74:3)
\end{tabular} \\
\hline (208:15) (208:18) & \(\begin{array}{ll}\text { speed } & (187: 23) \\ \text { speedy } & (8: 18)\end{array}\) & \[
\begin{aligned}
& (126: 7)(126: 14) \\
& (127: 19)(127: 22)
\end{aligned}
\] & \[
(75: 5)(89: 2)(89: 3)
\] \\
\hline \((233: 19)(241: 10)\)
\((241: 20)(245: 19)\) & \(\begin{array}{ll}\text { speedy } & (8: 18) \\ \text { spell } & (173: 24)\end{array}\) & \((127: 19)(127: 22)\)
\((128: 12)(128: 15)\) & \[
(75: 5)(89: 2)(89: 3)
\]
\[
(89: 5)(123: 19)
\] \\
\hline \((245: 20)(247: 9)\) & (224:16) & \((128: 18)(128: 22)\) & (159:19) (211:2) \\
\hline (273:9) (275:23) & spelled (100:19) & \((129: 2)(129: 6)\) & (222:3) (226:25) \\
\hline (279:4) (281:24) & spleek (16:9) & (129:11) (129:23) & starts (124:18) \\
\hline sources (29:19) & spot (236:15) & \((130: 3)(130: 6)\) & (131:16) (216:25) \\
\hline \((29: 20)(29: 22)(30: 6)\) & spreadsheets (132:15) & (130:11) (130:13) & (237:7) \\
\hline \((31: 3)(31: 19)(31: 21)\) & square (247:5) & (133:13) (133:25) & state (14:5) (15:3) \\
\hline \((73: 2)(73: 18)(75: 18)\) & stable (76:8) & (134:3) (134:4) (134:5 & (15:5) (15:8) (17:23) \\
\hline (93:22) (153:12) & stack (28:2) (28:5) & (134:7) (134:18) & \((18: 3)(18: 6)(18: 10)\) \\
\hline \((153: 15)(153: 16)\) & (30:7) (32:4) (32:5) & (145:9) (145:11) & \[
\begin{aligned}
& (18: 12)(18: 13)(18: 17) \\
& (22: 14)(22: 24)(22: 25)
\end{aligned}
\] \\
\hline \((153: 20)(153: 25)\) & \((32: 12)(33: 9)(33: 12)\) & \((145: 14)(145: 16)\)
\((145: 17)(145: 21)\) & \[
(23: 3)(23: 15)(24: 11)
\] \\
\hline (154:14) (175:25) & \((33: 14)(34: 2)(34: 6)\)
\((34: 7)(34: 23)(36: 14)\) & \((145: 17)(145: 21)\)
\((157: 10)(160: 18)\) & \((24: 17)(26: 21)(28: 12)\) \\
\hline (176:18) (184:18) & \((36: 15)(57: 10)(57: 17)\) & \((182: 7)(196: 13)\) & \((32: 8)(64: 7)(92: 1)\) \\
\hline \((235: 19)(236: 22)\) & \((57: 24)(58: 1)(59: 2)\) & (201:16) (201:18) & (145:17) (145:22) \\
\hline \((236: 25)(237: 7)\) & \((94: 23)(95: 1)(95: 16)\) & (202:18) (208:3) & (173:21) (176:5) \\
\hline (237:10) (246:25) & (108:2) (108:7) & (208:7) (232:10) & (181:13) (181:14) \\
\hline \((248: 16)(254: 6)\) & (108:10) (117:23) & \((242: 6)(243: 8)\) & (181:18) (181:19) \\
\hline (254:11) (272:9) & (118:11) (122:24) & (246:17) (246:18) & (181:23) (226:1) \\
\hline south (21:24)(21:25) & (123:2) (123:22) & (257:9) (257:10) & (232:10) (240:7) \\
\hline \((22: 1)(72: 4)(79: 22)\) & \((125: 19)(137: 14)\) & (258:15) (258:20) & \[
(240: 15)(246: 17)
\] \\
\hline \((81: 5)(82: 7)(83: 3)\) & (150:5) (177:1) (177:4) & (258:25) (259:7) & \[
(250: 15)(260: 20)
\] \\
\hline (142:12) (142:18) & (179:18) (199:14) & (260:13) (260:14) &  \\
\hline (143:9) (143:15) & \((200: 13)(200: 14)\)
\((238: 8)(238: 10)\) & \[
(260: 23)(260: 25)
\] & statement (5:22) \\
\hline \((144: 13)(160: 24)\)
\((227: 8)(227: 11)\) & \((238: 8)(238: 10)\)
\((238: 13)(253: 15)\) & \((261: 6)(261: 16)\) & (8:23) (105:13) \\
\hline southeast (160:21) & (253:18) (265:11) & (261:22) (262:3) & \((148: 20)(149: 6)\) \\
\hline southern (175:22) & \((267: 12)(268: 15)\) & (262:14) (273:23) & (223:1) (225:8) (247:2) \\
\hline southwesterly & \((277: 16)(277: 17)\) & (283:2) (283:19) & \[
(248: 2)(249: 5)
\]
\[
(254: 10)(265: 22)
\] \\
\hline southwestern & stacked (37:9) & standards (6:24) & \((254: 10)(265: 22)\) \\
\hline
\end{tabular}
\begin{tabular}{|c|c|c|c|}
\hline \multicolumn{2}{|l|}{states} & \multicolumn{2}{|r|}{sweep} \\
\hline (276:19) & steel's (102:10) & (243:15) (243:18) & suggest (81:8) \\
\hline states (1:4)(5:4) & (104:14) (105:19) & \((243: 21)(243: 24)\) & suggeation (217:13) \\
\hline (22:20) (22:21) & (119:10) (131:11) & (244:1) (244:25) & auite (2:11) \\
\hline (221:10) (222:1) & (169:6) (172:8) & (245:4)(271:2) & sulfide (42:20) \\
\hline status (220:5) & \((224: 24)(243: 16)\) & \begin{tabular}{l}
studying (232:2) \\
stuff (58:21)(58:25)
\end{tabular} & \[
\begin{aligned}
& (201: 18)(202: 14) \\
& (202: 16)(230: 24)
\end{aligned}
\] \\
\hline (220:20) (221:6) & \((253: 10)(266: 15)\)
\((267: 25)\) & stuff (58:21)(58:25) (187:25) & \[
\begin{aligned}
& (202: 16)(230: 24) \\
& (232: 2)(232: 6)
\end{aligned}
\] \\
\hline (221:22) & \[
\begin{aligned}
& (267: 25) \\
& \text { step }(41: 1)(51: 4)
\end{aligned}
\] & \[
\begin{array}{|l}
(187: 25) \\
\text { sub-bullet (246:15) }
\end{array}
\] & \[
\begin{aligned}
& (232: 2)(232: 6) \\
& (232: 10)(232: 20)
\end{aligned}
\] \\
\hline \[
\left\lvert\, \begin{aligned}
& \text { stay }(4: 21)(188: \\
& (218: 25)(219: 17)
\end{aligned}\right.
\] & \[
\begin{aligned}
& \text { step }(41: 1)(51: 4) \\
& (54: 16)(88: 4)(117: 18)
\end{aligned}
\] & subcommittee (127:3) & (232:21) (282:2) \\
\hline staying (203:15) & \((235: 3)\) & (242:15) (242:24) & \begin{tabular}{l}
sulfides (197:18) \\
sulfur \((7: 22)(20: 11)\)
\end{tabular} \\
\hline \begin{tabular}{l}
stays (34:17) \\
(185:16) (273:10)
\end{tabular} & \[
\begin{aligned}
& \text { step-by-step }(40: 24) \\
& \text { steps }(273: 21)
\end{aligned}
\] & subject (11:24)
\[
(17: 24)(25: 15)(50: 5)
\] & \[
\begin{array}{|l}
\text { sulfur }(7: 22)(20: 11) \\
(38: 3)(42: 18)(43: 16)
\end{array}
\] \\
\hline (273:17) & still (12:1) (40:15) & \((72: 24)(88: 9)(90: 2)\) & (197:13) (197:17) \\
\hline steady (32:8) & (42:9) (47:14) (56:18) & (91:16) (111:24) & (198:7) (198:8) (200:9) \\
\hline steel (1:4) (2:9) & \((57: 20)(57: 21)(74: 17)\) & \((114: 20)(115: 10)\) & (200:13) (229:3) \\
\hline \((2: 10)(2: 12)(4: 3)\) & \((99: 24)(157: 9)\) & \((117: 24)(119: 6)\) & (230:24) (232:5) \\
\hline \((4: 22)(5: 4)(5: 11)\) & \((175: 15)(178: 7)\) & \((146: 25)(166: 15)\) & (232:17) (232:21) \\
\hline \((5: 12)(5: 13)(5: 14)\) & \((183: 15)(194: 4)\) & \((166: 17)(166: 20)\) & (232:23) (281:3) \\
\hline \((8: 2)(8: 14)(9: 4)\) & \((196: 12)(198: 9)\) & \((167: 20)(167: 25)\) & (281:4) (282:1) (283 \\
\hline \((9: 13)(9: 22)(11: 3)\) & (200:15) (210:4) & (172:5) (172:18) & (283:9) \\
\hline \((11: 4)(11: 12)(12: 17)\) & (231:6) (248:13) & \((177: 19)(201: 15)\) & summary (71:9)
\[
(71: 16)(141: 9)(147: 20)
\] \\
\hline \((12: 22)(27: 17)(30: 12)\) & (249:3) (255:15) & \((220: 4)(221: 5)(227: 8)\)
\((236: 25)(238: 2)\) & \[
(71: 16)(141: 9)(147: 20)
\]
summation (52:13) \\
\hline \((31: 2)(31: 25)(48: 24)\) & stipulated (4:4) & \[
\begin{aligned}
& (236: 25)(238: 2) \\
& (239: 25)(252: 15)
\end{aligned}
\] & \[
\begin{aligned}
& \text { aummation } \\
& \text { summer } \quad(230: 17)
\end{aligned}
\] \\
\hline \[
\begin{aligned}
& (49: 2)(49: 4)(49: 20) \\
& (50: 22)(53: 3)(54: 20)
\end{aligned}
\] & \((172: 8)(198: 13)\)
\((198: 16)(198: 17)\) & \[
(265: 8)
\] & (230:18) \\
\hline (56:14) (60:17) (62:7) & (199:2) (199:4) & submission (23:19) & supermar (6:19) \\
\hline (62:19) (70:13) (73:11) & stipulates (61:19) & \[
(31: 6)
\] & \begin{tabular}{l}
supervision (286:9) \\
supervisor (231:6)
\end{tabular} \\
\hline \((73: 18)(73: 20)(74: 14)\) & stipulating (234:1) & \[
\begin{aligned}
& \text { submit } \quad(18: 12) \\
& (18: 22) \\
& (24: 18)(26: 16)
\end{aligned}
\] & supervisor (231:6)
\[
(232: 16)
\] \\
\hline \((77: 19)(78: 3)(86: 3)\)
\((86: 7)(86: 8)(86: 13)\) & \[
\begin{aligned}
& \text { stipulation }(172: 9) \\
& \text { stipulations }(4: 5)
\end{aligned}
\] & \[
\begin{aligned}
& (18: 22)(24: 18)(26: 16) \\
& (28: 12)(29: 18)(31: 3)
\end{aligned}
\] & \[
\begin{aligned}
& \text { (232:16) } \\
& \text { supposed } \\
& \text { (236:12) }
\end{aligned}
\] \\
\hline \((86: 7)(86: 8)(86: 13)\)
\((87: 10)(93: 4)(97: 6)\) & stipulations
\((4: 7)(91: 10)\) & \((31: 7)(53: 6)(71: 12)\) & sure (15:8) (19:22) \\
\hline \((97: 8)(102: 2)(102: 25)\) & stop (11:6) (40:22) & \((185: 7)(185: 13)\) & \((25: 24)(28: 16)(31: 22)\) \\
\hline \((108: 21)(111: 10)\) & (78:15) & (185:14) (185:17) & (39:21) (41:17) (62:13) \\
\hline \((116: 8)(118: 14)\) & stopped (224:9) & (206:20) (241:25) & (65:20) (66:9) ( \(74: 8)\) \\
\hline \((120: 14)(125: 5)\) & story (57:5)(57:6) & submits (18:13)
submitted
(18:16) & (90:19) (90:24) (93:25) (102:4) (109:9) (114:1) \\
\hline \((128: 15)(129: 10)\) & straight ( \(35: 10\) ) & submitted (18:16) & \[
\begin{aligned}
& (102: 4)(109: 9)(114: 1) \\
& (116: 2)(125: 1)(135: 7)
\end{aligned}
\] \\
\hline (130:3) (131:6) (132:6) & stratosphere ( \(36: 8)\)
street (1:14)
\((2: 3)\) & \[
\begin{aligned}
& (23: 11)(24: 6)(27: 22) \\
& (86: 3)(185: 21)(196: 7)
\end{aligned}
\] & \[
\begin{aligned}
& (116: 2)(125: 1)(135: 7) \\
& (138: 2)(139: 2)
\end{aligned}
\] \\
\hline \((133: 20)(134: 1)\)
\((134: 6)(139: 15)\) & street (1:14) (2:3)
\((2: 7)(2: 11)\) & \[
\begin{aligned}
& (86: 3)(185: 21)(196: 7) \\
& (203: 17)(240: 16)
\end{aligned}
\] & \[
(140: 19)(148: 22)
\] \\
\hline (144:25) (146:21) & stress (11:8) & (241:3) (272:19) & (163:23) (175:2) \\
\hline (151:8) (152:13) & (151:19) (151:23) & (272:20) & (179:14) (182:19) \\
\hline \((152: 21)(154: 20)\) & (152:1) (152:24) & submitting (185:24) & (187:4) (194:17) \\
\hline \((161: 18)(163: 7)\) & (167:25) & subscribed (286:13) & (194:24) (205:14) \\
\hline \((164: 18)(164: 24)\) & stresses (151:14) & subsequent (111:23) & (205:17) (210:20) \\
\hline \((165: 20)(166: 1)\) & (151:15) & (213:2) (221:19) (229:4 & (217:17) (237:16) \\
\hline (166:3) (166:23) & strict (10:7)(137:23) & subsequently (31:5) & (241:2) (241:21) \\
\hline \((168: 23)(170: 3)\) & strike (48:5) & substantial (8:6) & \[
\begin{aligned}
& (241: 23)(245: 21) \\
& (246: 4)(250: 19)
\end{aligned}
\] \\
\hline (170:12) (172:5) & stringent (9:15) & \begin{tabular}{l}
substantially (72:2) \\
(72:14) (102:2) (204:23)
\end{tabular} & \[
\begin{aligned}
& (246: 4)(250: 19) \\
& (255: 2)(255: 8)
\end{aligned}
\] \\
\hline \((182: 17)(183: 4)\) & \((12: 21)(24: 11)(24: 16)\)
\((26: 14)(26: 21)(27: 2)\) & \begin{tabular}{l}
\[
(72: 14)(102: 2)(204: 23)
\] \\
substitute (265:16)
\end{tabular} & \[
\begin{aligned}
& (255: 2)(255: 8) \\
& (255: 10)(256: 4)
\end{aligned}
\] \\
\hline \((183: 25)(184: 10)\) & \((26: 14)(26: 21)(27: 2)\)
\((27: 7)(28: 1)(67: 24)\) & \begin{tabular}{l}
substitute (265:16) \\
substituted (155:14)
\end{tabular} & \[
\begin{aligned}
& (255: 10)(256: 4) \\
& (256: 23)(257: 25)
\end{aligned}
\] \\
\hline \((184: 16)(184: 17)\) & \[
(27: 7)(28: 1)(67: 24)
\]
\[
(67: 25)(91: 17)(96: 1)
\] & \begin{tabular}{l}
substituted (155:14) \\
subtract (189:9)
\end{tabular} & \[
(268: 5)(273: 7)(283: 24)
\] \\
\hline \((186: 24)(190: 5)\)
\((191: 1)(191: 21)\) & \((96: 9)(96: 12)(104: 25)\) & (190:9) & surprising (8:24) \\
\hline \((191: 25)(202: 2)\) & (182:7) (208:16) & subtracting (189:10) & surprisingly (137:20) \\
\hline \((203: 16)(210: 3)\) & (254:21) (255:7) & (190:4) & surrogate (33:19) \\
\hline (214:19) (216:5) & strip (57:13) & \begin{tabular}{l}
success (54:25) \\
successful (203:6)
\end{tabular} & \[
\begin{aligned}
& (33: 24)(154: 16) \\
& (177: 11)(179: 12)
\end{aligned}
\] \\
\hline (216:7) (218:18) & striped (38:5)
stripped
(57:21) & successful (203:6)
\[
(203: 18)
\] & \[
(264: 20)(265: 12)
\] \\
\hline \((220: 2)(221: 10)\)
\((222: 1)(225: 7)\) & stripped (57:21)
strong (164:15) & successive (199:11) & \[
(265: 15)(265: 23)
\] \\
\hline \((222: 1)(225: 7)\)
\((225: 24)(227: 13)\) & \(\begin{array}{ll}\text { strong } & (164: 15) \\ \text { struck } & (6: 11)\end{array}\) & (256:7) & (266:1) (266:13) \\
\hline (227:18) (228:17) & structure (95:2) & such (7:22) (67:3) & (267:1) (271:13) \\
\hline (228:18) (229:8) & structures (265:5) & (70:6) (137:23) & \((277: 22)(281: 22)\) \\
\hline \((240: 12)(242: 7)\) & student (15:17) & (159:22) (183:18) & \[
(282: 8)
\] \\
\hline \((245: 1)(252: 9)\) & (233:10) (12.7) & \[
(208: 9)(208: 10)
\]
\[
(208: 12)(208: 15)
\] & surrogates (272:3)
\[
(2.81: 12)(281: 15)
\] \\
\hline \((255: 14)(256: 6)\) & studies (12:7) & \[
\begin{aligned}
& (208: 12)(208: 15) \\
& (211: 9)(239: 19)
\end{aligned}
\] & \[
\begin{aligned}
& (2.81: 12)(281: 15) \\
& (281: 16)(281: 19)
\end{aligned}
\] \\
\hline (258:11) (259:7) & (137:18) (243:20) & (211:9) (239:19) & (281:16) (281:19) \\
\hline (261:15) (263:9) & study ( \(79: 18)(84: 16)\) & \[
(271: 3)(277: 5)
\] &  \\
\hline (263:21) (264:17) & \((137: 22)(231: 5)\) & sufficient (55:16) & \begin{tabular}{l}
surround (176:5) \\
sustained (12:23)
\end{tabular} \\
\hline (267:11) (275:22) & (231:25) (232:5) & (86:16) (147:6) & \begin{tabular}{l}
sustained (12:23) \\
swallow (223:4)
\end{tabular} \\
\hline \[
\begin{aligned}
& (278: 2)(279: 5)(284: 1) \\
& (284: 10)
\end{aligned}
\] & \((232: 6)(232: 11)\)
\((232: 20)(233: 9)\) & \[
\begin{aligned}
& \text { suffocation (223:11) } \\
& (225: 10)
\end{aligned}
\] & \[
\begin{aligned}
& \text { swallow } \quad(223: 4) \\
& \text { sweep } \quad(28: 17) \\
& \hline
\end{aligned}
\] \\
\hline
\end{tabular}
\begin{tabular}{|c|c|c|c|}
\hline & & & though \\
\hline ch & \multirow[t]{13}{*}{\begin{tabular}{|l} 
tar (271:16) \\
target \((100: 10)\) \\
\((100: 21)(100: 25)\) \\
\((101: 23)(102: 20)\) \\
\((103: 1)(103: 4)(103: 7)\) \\
\((104: 10)(104: 20)\) \\
\((267: 5)(267: 15)\) \\
targets \((101: 17)\) \\
\((101: 20)(102: 3)(102: 7)\) \\
tars \(\quad(37: 21)(38: 2)\) \\
task \((175: 4)(202: 22)\) \\
team \((202: 11)\) \\
tech (15:22) \\
technical \(\quad(6: 24)\)
\end{tabular}} & 5) & \multirow[t]{66}{*}{} \\
\hline (126:6) (180:4) (249:7) & & (189:13) (190:8 & \\
\hline (252:19) (262:23) & & \((190: 13)(190: 16)\) & \\
\hline switching (134:24) & & \((190: 20)(190: 21)\) & \\
\hline sworn (5:18) (5:19) & & \((191: 2)(191: 10)\) & \\
\hline \[
(14: 2)(173: 17)(286: 8)
\] & & ats (177:4) & \\
\hline \[
\text { system }(20: 19)
\] & & (277:16) & \\
\hline \[
(20: 20)(20: 22)(20: 23)
\] & & than (12:16) (12:21 & \\
\hline (211:8) (225:14) & & (12:22) (23:1) (24:11) & \\
\hline (225:19) (225:24) & & \[
\begin{aligned}
& (24: 17)(26: 21)(51: 25) \\
& (54: 5)(54: 6)(54: 8)
\end{aligned}
\] & \\
\hline \[
\begin{aligned}
& (225: 25)(226: 2) \\
& (239: 18)
\end{aligned}
\] & & \[
\begin{aligned}
& (54: 5)(54: 6)(54: 8) \\
& (54: 9)(54: 10)(54: 1
\end{aligned}
\] & \\
\hline systems (223:10) & & \((63: 7)(67: 24)\) & \\
\hline T & & :11 & \\
\hline tab (119:18)(21 & technically (17:3 & \begin{tabular}{l}
\[
(140: 5)(144: 14)
\] \\
(144:17)(148:3)
\end{tabular} & \\
\hline (214:13) (244:17) & (216:25)
technological & \[
\begin{aligned}
& (144: 17)(148: 3) \\
& (149: 3)(162: 6)
\end{aligned}
\] & \\
\hline \((244: 18)(244: 19)\)
\((260: 7)\) & technological & \[
\begin{array}{|l}
(149: 3)(162: 6) \\
(174: 20)(178: 20
\end{array}
\] & \\
\hline tabbed (278:2) & technology (15: & \((179: 25)(190: 18)\) & \\
\hline table (84:1) (236:17) & \((20: 3)(20: 7)(26: 9)\) & \((190: 22)(194: 3)\) & \\
\hline (236:18) (236:22) & \((27: 12)(33: 3)(40: 3\) & (199:6) (201:5) (2 & \\
\hline \((237: 7)(240: 23)\) & (128:3) (153:22) & (208:17) (216:14) & \\
\hline (241:9)(241:17)(254 & telling (59:4)(59:8) & (235:20) (254:18) & \\
\hline tables (240:23) & (73:5)(98:23) (148:13) & (254:22) (255:19) & \\
\hline take-away (82:5) & (256:3) & (263:19) (267:9) & \\
\hline (231:25) & tells (32:13) (32:23) & \((268: 24)(275: 16)\) & \\
\hline take-aways (83:20) & temperature (32:9) & thank ( \(5: 23)(8: 21\) & \\
\hline taken (8:2)(10:3) & \((34: 8)(38: 13)(42: 8)\) & (13:12) (14:8) (131:22) & \\
\hline (23:24) (39:8) (174: & (150:6) & \((174: 1)(174: 24)\) & \\
\hline (200:6) (200:8) (211 & ten (85: & \((210: 7)(214: 2)\) & \\
\hline (215:25) (239:19) & (171:9) & \((215: 18)(218: 5)\) & \\
\hline \((244: 4)(260: 3)(286:\) & tens (10:24)(11:12 & \((219: 18)(221: 15)\) & \\
\hline takes (28:22) (72:19 & term (176 & \((224: 20)(225: 21)\) & \\
\hline \[
(95: 8)(95: 11)(160: 5)
\] & terms (7:25)(15:11 & (227:21) (229:15) & \\
\hline \[
(175: 7)(188: 18)(213: 3)
\] & (23:4) (23:18) (42:11 & \((234: 12)(285: 3)\) & \\
\hline taking (7:17)(50:3) & \((43: 3)(50: 13)(61: 12)\) & thanksgiving (6: & \\
\hline \((59: 23)(152: 21)\) & \((76: 24)(152: 6)(162: 2)\) & \[
(6: 10)
\] & \\
\hline (211:4) (229:12) & (185:3) (191:13) & the one \(190: 22\) ) & \\
\hline (239:15) & \((195: 13)(203: 17)\)
\((224: 3)(253: 8)\) & themselves (5:7)
\[
(226: 3)(248: 9)
\] & \\
\hline talk (22:6)(30:5) & \((224: 3)(253: 8)\)
test (87:5)(146:7 & theoretically (42:1) & \\
\hline \[
\begin{aligned}
& (35: 14)(64: 21)(86: 22) \\
& (106: 19)(106: 23)
\end{aligned}
\] & \[
\begin{aligned}
& \text { test } \quad(87: 5)(14 \\
& (146: 9)(146: 13)
\end{aligned}
\] & \[
\begin{aligned}
& \text { theoret } \\
& (163: 3)
\end{aligned}
\] & \\
\hline (107:1) (107:3) & \((146: 15)(147: 22)\) & there' (192: & \\
\hline \((117: 22)(172: 15)\) & \((148: 23)(160: 12)\) & therefore (165:7) & \\
\hline \((235: 8)(245: 22)\) & (271:8) & thereof (207:20) & \\
\hline (246:6) (249:7) & testified (14:2 & (208:19) & \\
\hline (252:19) (252:20) & (147:4) (173:17) & thermal (151:1 & \\
\hline (253:4) (262:23) & (235:22) (239:4) & \((151: 15)(151: 19)\) & \\
\hline (265:14) (285:10) & testify (139:4) & \((151: 23)(152: 1)\) & \\
\hline talked (57:11) & (286:8) & (152:24) (167:25) & \\
\hline (79:10) (108:4) & testifying (5:17) & they'11 (26:8) & \\
\hline (134:24) (134:25) & teatimony (56:7) & they're (9:20)(10 & \\
\hline \((145: 6)(160: 24)\) & (96:8) (125:8) (126:11) & (31:22) (32:8)(34: & \\
\hline (164:4) (202:13) & (129:4) (129:13) & \((34: 14)(35: 21)(35: 2\) & \\
\hline (210:21) (246:11) & (135:1) (137:2) & \((35: 24)(46: 3)(46: 8\) & \\
\hline (251:8) (265:1) & \((138: 20)(140: 8)\) & \((47: 1)(47: 3)(50: 5)\) & \\
\hline talking (6:9) (6:20) & \((140: 10)(143: 22)\) & (53:4) (63:14) (63:19) & \\
\hline \((32: 20)(43: 8)(44: 20)\) & \((145: 7)(149: 2)\) & (75:3) (82:10) (88: & \\
\hline (63:6) (87:18) (88:2) & \((149: 20)(233: 6)\) & \((124: 23)(127: 3)\) & \\
\hline \((88: 12)(148: 2)(161:\) & \((238: 25)(239: 1)\) & \((127: 5)(127: 7)\) & \\
\hline (161:10) (184:12) & \((239: 23)(277: 7)\) & \((127: 13)(135: 9)\) & \\
\hline \((194: 25)(200: 17)\) & \((283: 7)(286: 8)(286: 9)\) & \((138: 13)(138: 15)\) & \\
\hline \[
(204: 13)(204: 15)
\] & (286:13) & \((138: 24)(140: 23)\) & \\
\hline \((209: 5)(233: 8)(234: 5)\) & testing (50:10) & \((140: 24)(149: 4)\) & \\
\hline (235:4) (238:1) & (50:11) (50:12) (53:2) & (150:14) (151:17) & \\
\hline (238:17) (245:21) & (64:11) (135:25) & \[
(156: 18)(156: 19)
\]
\[
(156: 20)(166: 9)
\] & \\
\hline \((263: 20)(265: 16)\)
\((265: 17)(267: 2)(270: 8)\) & \((164: 3)(164: 11)\)
\((164: 19)(165: 2)\) & \[
\begin{aligned}
& (156: 20)(166: 9) \\
& (166: 18)(166: 20)
\end{aligned}
\] & \\
\hline tall (34:12) & (166:22) (187:6) & \((167: 19)(167: 24)\) & \\
\hline tally (176:15) & \((187: 12)(187: 18)\) & \((174: 19)(178: 24)\) & \\
\hline
\end{tabular}
\begin{tabular}{|c|c|c|c|}
\hline \multicolumn{2}{|l|}{thought} & \multicolumn{2}{|r|}{underlying} \\
\hline \((50: 17)(57: 20)(60: 12)\) & times (12:21)(67:21) & toxics (40:7)(44:15) & (110:22) (112:22) \\
\hline \((60: 14)(76: 23)(82: 7)\) & \((178: 25)(197: 10)\) & (79:18) (126:15) & (114:17) (114:23) \\
\hline \((118: 12)(134: 21)\) & \((235: 12)(252: 1)\) & (126:17) (156:19) & (115:19) (118:14) \\
\hline (140:1) (180:15) & (252:4) (270:7) & (283:5) & (120:9) (134:9) \\
\hline \((190: 16)(200: 1)\) & \((271: 11)(278: 11)\) & toxin (81:23) & \[
(134: 13)(138: 18)
\] \\
\hline \((248: 15)(248: 19)\) & (279:5) & traffic (84:4) & \[
(139: 6)(140: 9)
\] \\
\hline (256:24) (278:18) & timing (188:3) & trail (36:17) & \[
(140: 15)(140: 16)
\] \\
\hline thought (114:24) & tip (10:23) & training (55:12) & \begin{tabular}{l}
(141:24) (143:20) \\
(143:24) (144:1)
\end{tabular} \\
\hline (115:16) (115:19) & tissues (225:19) & \[
\begin{aligned}
& (55: 13)(55: 15)(55: 21 \\
& (135: 23)(202: 5)
\end{aligned}
\] & \[
(159: 1)(159: 3)
\] \\
\hline \begin{tabular}{l}
\[
(276: 16)
\] \\
thoughtfu
\end{tabular} & title (31:3) (92:7)
\[
(219: 15)(236: 1)
\] & \[
\begin{aligned}
& (135: 23)(202: 5) \\
& (203: 24)
\end{aligned}
\] & \[
(161: 16)(162: 1)
\] \\
\hline thousand (171:7) & (236:6) (278:2) & transcript (286:9) & \((162: 6)(162: 11)\) \\
\hline (171:8) (171:9) & titled (79:8) & transportation (84:4) & \((162: 16)(162: 21)\) \\
\hline (171:11) (171:12) & today \((5: 2)(5: 17)\) & transported (144:20) traveling (94:1) & \[
\begin{aligned}
& (162: 22)(162: 25) \\
& (170: 2)(170: 22)
\end{aligned}
\] \\
\hline thousands (9:17) & \[
\begin{aligned}
& (6: 1)(6: 13)(8: 3)(8: 4) \\
& (9: 10)(9: 11)(18: 19)
\end{aligned}
\] & traveling (94:1) treated (198:17) & \[
(187: 11)(188: 15)
\] \\
\hline \((25: 13)(105: 20)\)
three (7:16) (21:5) & \((9: 10)(9: 11)(18: 19)\)
\((47: 23)(110: 11)\) & treated (199:3) (199:6) & (188:21) (188:24) \\
\hline (29:19) (60:19) (66:12) & (230:5) (285:7) & treatment (75:2) & (188:25) (189:5) \\
\hline \((78: 17)(85: 4)(85: 16)\) & together (37:9) & (75:7) (75:9) (75:25) & (189:9) (189:10) \\
\hline \((90: 11)(90: 17)(98: 2)\) & (66:6) (66:19) (202:22) & \((86: 12)(148: 6)\) & (189:23) (190:2) \\
\hline \((99: 21)(101: 24)\) & (203:1) (213:5) (213:7) & \((148: 14)(150: 7)\) & (190:4) (190:9) \\
\hline (102:11) (104:6) & (243:22) (268:7) & (246:25) & (190:10) (191:7) \\
\hline \((147: 6)(160: 1)\) & told (99:16) (100:20) & trees (216:22) & (191:8) (193:22) \\
\hline \((160: 15)(161: 3)\) & (101:18) (104:1) & trend (47:10)(77:3) & \[
(194: 1)(199: 10)
\] \\
\hline (161:9) (161:11) & (104:11) (104:24) & (160:11) & \[
(200: 11)(203: 17
\] \\
\hline (162:1) (162:6) & (105:6) (105:10) & tried (12:12) & (208:20) (214:4)
\[
(214: 6)(214: 10)
\] \\
\hline (182:23) (184:23) & (115:5) (117:9) & \[
\begin{aligned}
& \text { trigger (261:16) } \\
& (269: 15)
\end{aligned}
\] & (214:6) (214:10)
\[
(214: 11)(214: 12)
\] \\
\hline \((184: 24)(184: 25)\) & \((117: 17)(121: 14)\) & \[
\begin{array}{ll}
(269: 15) \\
\text { trigqers } & (11: 17)
\end{array}
\] & (214:11) (214:12)
\[
(216: 22)(240: 4)
\] \\
\hline \((185: 23)\)
\((202: 199: 19)\)
\((207: 11)\) & \((133: 10)(193: 21)\)
\((199: 21)(202: 5)\) & \[
\begin{aligned}
& \text { triggers } \\
& (53: 25)
\end{aligned}
\] & \[
(244: 17)(244: 19)
\] \\
\hline \((202: 18)(207: 11)\)
\((214: 13)(214: 14)\) & \((203: 5)(205: 2)\) & triple (167:23) & (256:7) (256:8) (257:2) \\
\hline \((214: 15)(215: 9)\) & (205:20) (220:11) & trouble (202:19) & (260:8) (261:17) \\
\hline (239:5) (252:22) & toluene (40:10) & true (117:11) & (274:9)(275:3) (277:1) \\
\hline (260:11) (274:9) & (44:23) (209:10) & (179:14) (286:9) & \[
(280: 14)
\] \\
\hline (274:11) (275:3)(275:8) & (226:19) (271:17) & truth (244:12) & \begin{tabular}{l}
two-page (4:7) \\
two-thirds (131:14)
\end{tabular} \\
\hline three-battery & tomorrow (230:5) & \[
\text { try }(30: 19)(32: 1)
\] & \[
(131: 19)
\] \\
\hline three-month (221:16) threshold (51:19) & \[
\begin{aligned}
& (230: 8)(285: 10) \\
& \text { ton }(34: 22)(59: 24)
\end{aligned}
\] & \[
(96: 22)(96: 24)(137: 8)
\] & type (28:25)(32:21) \\
\hline through (4:3)(6:23) & tonnage (177:22) & \((176: 18)(178: 18)\) & (34:9) (119:7) (152:17) \\
\hline (9:5) (19:9) (23:11) & (178:5) & (187:19) (224:10) & (166:18) (252:8) \\
\hline \((23: 22)(27: 15)(33: 14)\) & tons (34:23)(35:1) & (251:18) (251:19) & types (20:6)(75:25 \\
\hline \((33: 15)(40: 23)(45: 25)\) & (35:2) (161:7) & (253:2) (280:10) (281 & \[
(131: 6)
\] \\
\hline \((56: 4)(56: 6)(59: 1)\) & tony (231:5)(232:15) & trying (21:9)(33:20) & typically (33:6) \\
\hline \((61: 25)(67: 5)(67: 7)\)
\((67: 12)(71: 17)(90: 12)\) & \((233: 1)\)
took (9:8)(9:11) & \((126: 14)(136: 23)\) & \((40: 1)(45: 12)(74: 10)\) \\
\hline \((96: 5)(130: 15)\) & \((12: 5)(57: 1)(66: 7)\) & \((142: 25)(143: 7)\) & (168:1) \\
\hline (131:10) (131:14) & (155:14) (174:21) & \((179: 6)(216: 21)\) & U \\
\hline (135:23) (135:25) & (196:21) (202:5) & \[
(252: 5)(258: 17)
\] & \\
\hline (137:14) (154:3) & tool (132:11) &  & \[
(204: 6)(220: 22)(241: 3)
\] \\
\hline (165:12) (170:11) &  & \[
\text { turn }(10: 15)(43: 12)
\] & unborn (223:7) \\
\hline \((177: 2)(179: 20)\)
\((180: 8)(186: 21)\) & \((76: 23)(85: 3)(153: 24)\) & \((62: 5)(175: 11)(179: 6)\) & (225:12) \\
\hline \((187: 15)(196: 7)\) & \((154: 5)(192: 23)\) & (218:7) (219:23) & uncertainty (248:15) \\
\hline (197:5) (197:21) & (194:23) (224:25) & (220:24) (225:21) & under (8:10) (17:22) \\
\hline \((197: 25)(200: 6)\) & (240:23) & (227:5) (229:1) (233:3) & (18:5) (22:15) (26:9) \\
\hline (206:4) (207:11) & topics (117:22) & turning (36:6) & \[
(53: 12)(62: 24)(62: 25)
\] \\
\hline (211:10) (216:1) & (126:6) (134:25) & turns (36:1) & \[
(66: 23)(117: 20)
\] \\
\hline (223:10) (225:17) & \[
(252: 19)
\] & twenty-nine (119:19) twice (178:6) & \[
(129: 15)(130: 25)
\] \\
\hline (225:19) (230:1) & \begin{tabular}{l}
torrey (1:24) \\
total (11:10) (35:24)
\end{tabular} & \[
\begin{aligned}
& \text { twice }(178: 6) \\
& \text { two }(2: 7)(11: 3)
\end{aligned}
\] & \[
(144: 22)(155: 16)
\] \\
\hline \((239: 19)(242: 1)\)
\((242: 14)(242: 15)\) & \((63: 1)(199: 9)(272: 25)\) & \((11: 5)(11: 22)(12: 17)\) & \((155: 21)(156: 10)\) \\
\hline \((243: 2)(243: 7)\) & towards (68:24) & (12:19) (13:19) (13:22) & \((157: 5)(175: 16)\) \\
\hline (243:10) (248:5) & tower ( \(39: 8\) ) & \((14: 21)(39: 14)(42: 22)\) & (181:10) (182:6) \\
\hline (249:22) (253:1) & township (227:11) & (48:8) (49:13) ( \(52: 4)\) & \[
\begin{aligned}
& (196: 22)(196: 23) \\
& (198: 24)(201: 2)
\end{aligned}
\] \\
\hline (263:19) (268:9) & toxic (25:9)(37:22) & \[
\begin{aligned}
& (63: 19)(69: 4)(73: 20) \\
& (74: 16)(81: 3)(81: 18)
\end{aligned}
\] & \[
\begin{aligned}
& (198: 24)(201: 2) \\
& (203: 7)(211: 13)
\end{aligned}
\] \\
\hline throughout (248:20) & \((44: 16)(44: 22)(79: 23)\)
\((82: 3)(225: 12)\) & \[
\begin{aligned}
& (74: 16)(81: 3)(81: 18) \\
& (84: 19)(85: 13)(87: 18)
\end{aligned}
\] & \[
\begin{aligned}
& (203: 7)(211: 13) \\
& (214: 14)(223: 1)
\end{aligned}
\] \\
\hline \((250: 3)\)
thus \((45: 7)(233: 6)\) & \((82: 3)(225: 12)\)
\((250: 24)(251: 1)\) & \((88: 2)(90: 10)(90: 17)\) & (244:9) (244:10) \\
\hline tied (246:20) & (262:5) (262:10) & \((90: 19)(90: 25)(91: 6)\) & (260:5) (272:21) \\
\hline tighter (189:24) & (262:11) & \((91: 9)(97: 5)(97: 7)\) & \[
(278: 2)(286: 9)
\] \\
\hline (254:18) (254:21) & toxicological & \((97: 8)(101: 24)(109: 4)\) & \\
\hline
\end{tabular}
\begin{tabular}{|c|c|c|c|}
\hline \multicolumn{2}{|l|}{underneath} & \multicolumn{2}{|r|}{whose} \\
\hline underneath (57:16) & (129:22) (130:13) & (101:17) (101:20) & volatile (35:18) \\
\hline (58:14) & \((132: 7)(133: 11)\) & \((101: 23)(102: 3)\) & (36:3) \\
\hline understand (53:17) & \((133: 12)(149: 4)\) & \((102: 7)(102: 20)\) & volatiles (37:17) \\
\hline \((53: 21)(53: 23)(74: 2)\) & \((172: 4)(177: 11)\) & \((103: 1)(103: 4)(103: 7)\) & (37:25) (38:14) \\
\hline (78:4) (80:13) (85:24) & (177:21) (183:13) & (104:10) (155:24) & (57 \\
\hline \((89: 14)(99: 3)(105: 19)\) & (183:17) (184:13) & \((156: 5)(166: 18)\)
\((181: 11)(181: 24)\) & vol \\
\hline \((113: 20)(125: 8)\)
\((129: 12)(130: 18)\) & \((184: 18)(186: 4)\)
\((192: 14)(201: 18)\) & \((181: 11)(181: 24)\)
\((182: 2)(184: 22)\) & \[
(62: 6)(62: 7)
\] \\
\hline \((129: 12)(130: 18)\)
\((131: 25)(132: 9)\) & \((192: 14)(201: 18)\)
\((202: 17)(203: 13)\) & \((182: 2)(184: 22)\)
\((185: 5)(186: 5)\) & voluminous (9:21) \\
\hline (135:4) (148:12) & (216:3) (227:13) & \((186: 10)(186: 14)\) & (9:22) \\
\hline (151:19) (151:22) & (258:24) (259:2) & (186:17) (207:15) & W \\
\hline (152:1) (157:8) & (280:1) (280:4) (283:8) & \[
\begin{aligned}
& (211: 17)(212: 2) \\
& (212: 11)(213: 2)
\end{aligned}
\] & \\
\hline \((163: 13)(166: 25)\)
\((172: 22)(184: 6)\) & \[
\begin{aligned}
& \text { useful }(37: 25)(38: 4) \\
& (203: 12)
\end{aligned}
\] & \[
\begin{aligned}
& (212: 11)(213: 2) \\
& (213: 9)(215: 6)(252: 9)
\end{aligned}
\] & \[
(190: 7)
\] \\
\hline (216:19) (231:19) & uses (92:15)(250:14) & \((252: 13)(279: 7)\) & walls (59:1)(248:5) \\
\hline (231:22) (239:23) & (279:22) (280:6) & (279:10) & (248:6) (248:7) \\
\hline (244:24) (272:17) & using (116:23) & violations (6: & (248:11) (268:9) \\
\hline (273:7) (274:6) (275:19) & (178:13) (183:25) & (7:10) (7:13) (7:16) & wanted (5:23) ( \\
\hline understanding & \((184: 6)(184: 10)\) & \((7: 18)(7: 20)(9: 25)\) & (32:3) (54:22) (79:2) \\
\hline understood (159:2) & \((259: 4)(266: 13)(280: 9)\) & \((10: 2)(10: 4)(10: 16)\) & (105:6) (143:17) \\
\hline (171:17) & usually (22:24) & (16:19) (31:11) (48:11) & ward (263:11) \\
\hline unfortunately & (37:5) (192:19) & (51:2) (52:12) (61:7) &  \\
\hline unheard (160:1) & u-tube (197:1)(197:4) & \[
(61: 9)(65: 4)(68: 3)
\] & watch (268:17) \\
\hline \[
\begin{array}{|ll}
\text { unilateral } & (9: 9) \\
\text { unilaterally } & (181: 17)
\end{array}
\] & V & \((68: 5)(68: 8)(68: 9)\)
\((68: 11)(68: 12)(68: 14)\) & water (6:17) (39:11) \\
\hline unique (26:24) & vacate (13:11) & \((68: 20)(86: 7)(87: 16)\) & (86:22) (148:6) \\
\hline unit (15:2)(275:24) & vaguely (155:6) & \((87: 20)(87: 21)(93: 21\) & (148:14)(192:18) \\
\hline united (1:4)(5:4) & (163:20) & (94:10) (95:17) (99 & (192:19) (246:25) \\
\hline (221:10) (222:1) & validate (280:5) & \((99: 18)(102: 23)\)
\((107: 19)(107: 23)\) & \[
(30: 19)(35: 14)(39: 9)
\] \\
\hline  & valuable (38:9) & \((108: 7)(109: 17)\) & \((59: 25)(60: 21)(69: 9)\) \\
\hline (174:8) & value (6:6) \((6: 11)\) & (125:19) (146:18) & \((80: 15)(83: 10)(89: 11)\) \\
\hline unlawful (10:18) & \((47: 20)(81: 2)(84: 2)\) & (146:22) (156:1) & (100:13) (100:15) \\
\hline unless (70:8) & (96:7) (121:2) (159:21) & \((156: 5)(157: 2)(157: 6)\) & (108:19) (110:16) \\
\hline (210:15) (215:9) & (160:6) (179:6) & (157:7) (157:10) & (122:3) (124:8) \\
\hline unlikely (241:15) & values (60:22) & (157:11) (158:20) & (131:10) (131:14) \\
\hline unreachable (242:3) & \((81: 15)(81: 16)(82: 25)\) & (158:24) (159:5) & (131:19) (139:1) \\
\hline unreasonable (10:21) & (83:9) (83:19) (157:21) & (165:24) (182:19) & (153:18) (159:12) \\
\hline (48:6) & \((159: 15)(159: 20)\) & (182:20) (184:20) & (178:15) (178:17) \\
\hline until (50:21) (50:22) & \((200: 5)(200: 10)(281: 5)\) & (184:24) (184:25) & (185:22) (194:7)
\[
(216: 20)(237: 15)
\] \\
\hline (71:12) (126:2) & valve (196:24)(197:1) & \((185: 2)(185: 3)(185: 5)\) &  \\
\hline (162:22) (162:25) & \(\begin{array}{ll}\text { various }(28: 3)(58: 20) \\ \text { velocity } & (34: 8)\end{array}\) & \[
(191: 22)(198: 24)
\] & \[
\begin{aligned}
& (252: 22)(271: 8) \\
& (271: 12)(277: 13)
\end{aligned}
\] \\
\hline \[
\begin{aligned}
& (172: 25)(190: 19) \\
& (275: 7)
\end{aligned}
\] & velocity \((34: 8)\)
\((34: 13)(150: 6)\) & \((191: 22)(198: 24)\)
\((199: 7)(205: 6)\) & ways (192:12)(194:18) \\
\hline unusual (22:19) & vent (41:16) & \((205: 12)(207: 21)\) & weaker (190:22) \\
\hline update \((96: 20)(97: 2)\) & verified (130:16) & (210:23) (211:13) & (191:4) (191:5) (191:7) \\
\hline (97:17) (97:19) & (130:19) (130:22) & (211:23) (212:15) & website (206:14) \\
\hline updates (96:21) & (139:3) (207:7) & (215:8) (216:13) & week (139:8)(139:18 \\
\hline upon (29:21)(30:2) & verify (133:16) & (218:11) (237:19) & \begin{tabular}{l}
weeks (6:2)(6:16) \\
(244:3) (257:1) (257:
\end{tabular} \\
\hline (55:1) (203:12) (276:13) & (281:10) & \((237: 24)(238: 17)\)
\((238: 19)(238: 21)\) & \[
(260: 2)(260: 8)
\] \\
\hline uptick (277:7) & versa (181:4)
version (206: & \((238: 19)(238: 21)\)
\((252: 11)(252: 14)\) & weight (113:23) \\
\hline upwind (143:4) & (207:2) & (253:22) (254:1) & (202:15) (234:8) \\
\hline use (23:8)(31:24) & versus (1:7)(5:4) & (265:7) (270:4) (272:7) & (234:10) \\
\hline \((50: 12)(52: 3)(63: 23)\) & \((75: 24)(75: 25)(81: 17)\) & \((272: 14)(272: 23)\) & welfare (208:14) \\
\hline (88:10) (101:23) & \((164: 20)(178: 14)\) & (273:23) (274:13) & west (15:16) \\
\hline (123:8) (123:21) & \((188: 5)(191: 2)(205: 8)\) & (284:23) & westerly (227:16) \\
\hline \((125: 9)(135: 6)\) & (232:21) & virginia (15:16) & western (142:11) \\
\hline \((147: 16)(175: 20)\) & ves (179:11) & \begin{tabular}{l}
visible (43:1) \\
(126:15) (158:8)
\end{tabular} & whatever (24:14)
\[
(108: 24)(113: 24)
\] \\
\hline \((177: 8)(177: 11)\) & vice (181:4) & \[
\begin{aligned}
& (126: 15)(158: 8) \\
& (158: 12)(158: 16)
\end{aligned}
\] & \[
(151: 23)(160: 5)
\] \\
\hline \((178: 2)(178: 24)\)
\((184: 6)(186: 9)\) & viola- (157:4)
violate (17:21) & \((158: 12)(158: 16)\)
\((179: 12)(179: 17)\) & \[
\begin{aligned}
& (151: 23)(160: 5) \\
& (202: 25)(206: 15)
\end{aligned}
\] \\
\hline \((186: 12)(217: 9)\) & (61:19) (73:3) (101:12) & (198:2) (248:4) & (241:23) \\
\hline \((250: 20)(271: 13)\) & (121:23) (208:10) & (271:12) (271:14) & whatever's (251:18) \\
\hline \((279: 20)(280: 10)\) & violated (279:18) & (277:14) (277:21) & whatsoever (149:16) \\
\hline (280:18) (281:15) & violates (208:10) & (281:18) (282:8) & whereas (36:6) \\
\hline used (29:14) (31:13) & violating (17:1) & visual (58:2) & \begin{tabular}{ll} 
Whisp & \((89: 12)(178: 8)\) \\
whole & \((25: 19)(44: 21)\)
\end{tabular} \\
\hline \((33: 6)(38: 9)(38: 10)\) & (18:19) (88:21) & (156:18) (158:10) & whole (25:19)(44:21) \\
\hline \((38: 12)(38: 16)(38: 17)\) & violation (17:3) & (270:13) & (162:7) (199:15) \\
\hline \((61: 11)(79: 19)(80: 22)\) & (68:18) (100:10) & visually (36:25) voc (79:18) & \begin{tabular}{l}
(244:13) (276:7) \\
whose (66:24)
\end{tabular} \\
\hline \((88: 25)(99: 24)(129: 8)\) & \((100: 21)(100: 25)\) & voc (79:18) & whose (66:24) \\
\hline
\end{tabular}
\begin{tabular}{|c|c|c|}
\hline wide (37:7)(47:13) & (203:3) (203:7) (208:9) & \(Y\) \\
\hline (47:14) (103:9) & \((273: 10)(275: 11)\) & 1 \\
\hline \((103: 10)(265: 13)\) & (286:7) & yard \((63: 8)(64: 17)\) \\
\hline (265:24)(266:14) & without (6:16)(6:17) & (167:12) (191:15) \\
\hline (267:1) (271:4) (271:5) & (6:18) (50:23) (61:22) & yearly (185:13) \\
\hline willing (233:21) & (87:2) (129:7) (147:11) & \[
\begin{aligned}
& (185: 14) \\
& \text { years }
\end{aligned}(12: 5)(14: 21)
\] \\
\hline (233:24)
willis
\((2: 2)(3: 3)\) & (181:23) (233:23)
withstand (275:20) & \[
\begin{array}{cc}
\text { years } & (12: 5)(14: 21) \\
(15: 1) & (17: 11)(19: 5)
\end{array}
\] \\
\hline \((3: 4)(3: 5)(3: 7)(3: 8)\) & withstanding (16:13) & \((29: 20)(55: 21)(64: 2)\) \\
\hline \((3: 9)(5: 8)(5: 21)\) & witness (3:2)(5:16) & \((64: 14)(83: 7)(86: 15)\) \\
\hline \((5: 23)(8: 22)(13: 13)\) & (13:14) (14:1) (56:3) & (185:22) (200:3) \\
\hline \((13: 24)(14: 4)(40: 19)\) & \((172: 5)(173: 14)\) & (200:4) (203:7) (205:3) \\
\hline \((44: 19)(56: 1)(56: 10)\) & \((173: 16)(233: 6)\) & (245:11) (245:12) \\
\hline \((59: 15)(61: 24)(62: 4)\) & (233:10) (234:4) & \((249: 4)(274: 9)(275: 3)\) \\
\hline (62:11) (62:14) (69:16) & witness' (56:7) & (275:8) (276:18) \\
\hline \((78: 10)(78: 13)(78: 16)\) & witnesses (3:1) & (276:21) (276:22) \\
\hline \((78: 25)(84: 16)(84: 18)\) & \((5: 16)(5: 19)(224: 1)\) & (277:1) (277:9) \\
\hline \((90: 3)(104: 1)(111: 21)\) & (286:9) & year's (274:8)(275:2) \\
\hline (112:4) (112:8) & woman (230:18) & years' (96:5)(274:11) \\
\hline (112:12) (112:25) & won't (22:25)(38:20) & yet (6:22)(81:7) \\
\hline \((113: 7)(113: 17)\) & (188:22) & (172:18) (216:2) \\
\hline (114:1) (116:14) & word (85:5) (147:14) & you'd (6:19)(43:7) \\
\hline (129:17) (135:1) & (223:15) (224:10) & (68:23) (138:23) \\
\hline \((141: 17)(141: 22)\) & (232:1) (271:13) & (220:24) (228:15) \\
\hline (141:25) (154:24) & words (151:10) & yup (244:8)(244:11) \\
\hline \((154: 25)(155: 2)\) & work (14:22)(16:6) & Z \\
\hline (168:15) (171:1) & (110:15) (179:2) & \\
\hline (172:3) (172:11) & (181:3) (181:6) (202:7) & zero (33:13)(75:10) \\
\hline \((172: 16)(172: 23)\) & (227:13) (229:13) & (108:7) (157:2) (157:4) \\
\hline \((173: 2)(173: 6)(173: 7)\) & (249:22) (268:6) & (157:11) (167:16) \\
\hline (173:13) (173:15) & \((268: 8)(268: 9)(278: 6)\) & (168:2) (234:3) \\
\hline (173:20) (190:24) & (281:7) & zeros (167:17) \\
\hline (206:4) (206:9) (210:7) & worked (9:4)(14:23) & \\
\hline (210:14) (210:18) & \((30: 12)(66: 1)(86: 15)\) & \\
\hline (213:17) (213:20) & working (33:4) & \\
\hline (213:22) (214:2) & (82:15) (101:21) & \\
\hline (214:5) (214:7) (214:9) & (177:23) & \\
\hline (214:11) (214:13) & works (16:3)(28:17) & \\
\hline (214:16) (215:13) & \((39: 9)(73: 6)(74: 14)\) & \\
\hline (215:15) (215:18) & \((75: 23)(75: 24)(77: 10)\) & \\
\hline \((215: 19)(216: 19)\) & \((79: 24)(84: 22)(87: 7)\) & \\
\hline \((217: 5)(217: 8)\) & (106:24) (108:19) & \\
\hline (217:19) (217:22) & (110:16) (185:1) & \\
\hline (218:6) (218:21) & (227:10) (228:18) & \\
\hline \((219: 3)(219: 6)\) & (233:22) & \\
\hline (219:10) (219:13) & worse (11:10)(49:8) & \\
\hline (219:16) (219:20) & worst (11:13)(82:22) & \\
\hline (224:19) (227:21) & (85:11) (134:9) & \\
\hline (228:8) (229:15) & (134:13) (161:16) & \\
\hline (229:22) (230:6) & (161:20) (161:23) & \\
\hline (230:9) (230:12) & (162:1) (162:9) & \\
\hline (233:13) (233:14) & \((162: 12)(162: 16)\) & \\
\hline (234:12) (234:16) & (162:21) (170:22) & \\
\hline (244:20) (269:21) & worth (192:2) (274:7) & \\
\hline (269:22) (269:24) & (274:9)(274:11) (275:2) & \\
\hline (282:10) (284:6) & writing (286:8) & \\
\hline (284:9) (285:3) & written (69:24) & \\
\hline willis' (113:22) & (70:9) (148:14) & \\
\hline wind (35:9) (227:16) & (188:12) (189:12) & \\
\hline (231:1) (232:23) & (189:13) & \\
\hline (233:17) & wrong (46:13)(71:25) & \\
\hline winds (142:14) & (76:22) (164:18) & \\
\hline winek (2:6) (5:13) & (231:12) & \\
\hline \begin{tabular}{l}
withdraw (38:8) \\
withdrawn (38:2)
\end{tabular} & X & \\
\hline (187:3) (216:18) & xylene (40:10) & \\
\hline \[
\begin{aligned}
& \text { withdrew }(216: 7) \\
& (218: 20)
\end{aligned}
\] & \[
\begin{aligned}
& (44: 24)(209: 10) \\
& (271: 17)
\end{aligned}
\] & \\
\hline within (7:24)(22:11) & xylenes (226:21) & \\
\hline \[
\begin{aligned}
& (27: 24)(124: 18) \\
& (178: 16)(185: 16)
\end{aligned}
\] & \(x-y-1-e-n-e-s\) & \\
\hline
\end{tabular}```


[^0]:    is?

[^1]:    

