## Strategies for Analyzing Claims

### 1) What are the numbers, even if they're hidden?

A measurable claim will talk about something that can be quantified. The real number may be implied but not shown.

**Strategy:** Push to get the claim as specific as possible. There's a number there somewhere. If not, justification is needed.

> *Mercury levels in the soil tests were all below the legal limit.*

Can you spot the two missing numbers? *Mercury levels* means they tested for mercury in the soil and got numbers, even if they're not listed. *The legal limit* is a number published by a regulating agency; you can look it up.

### 2) What are the units?

What is being measured and how is it being measured? Units can be simple: feet, tons, jobs. They also could be a rate or ratio of other units, using "/" or "per", like *truck trips per day* or *µg/L*.

**Strategy:** Learn about the units, common abbreviations and symbols, and how different units relate to each other. Practice converting strange units to familiar ones. It might be easier to imagine *pounds per day* than *tons per year*.

> *The new power plant will reduce residential electricity rates.*

Units might not be explicit. *Electricity rates* means what you pay for power. Look it up; it's usually in dollars per kilowatt-hour ($/kWh).

### 3) Do any numbers represent a larger set of data?

Sometimes one number is calculated from a much larger set of data. Then that number is then presented as "typical" of that data. There are different "typical" calculations: *average, mean, median, mode*. There are also ways to show variation in the data: *margin of error, standard deviation*.

**Strategy:** Get the original data. Find out how it was calculated, what was and was not included. Learn about the different terms and when they should be used. A median may be more representative than an average. The data might be too variable or too unreliable to summarize with one number. They may have ignored important data. Decide if the number represents what is most important in the data – you may care more about a maximum than what is "typical."

> *Average smokestack emissions are below the 30 ppm monthly limit.*

What if the plant only operates in the summer? An average over the whole year won't show how bad it is in July. Also, if they looked at the whole county instead of just the area that was sprayed, they might not detect much pollution.

### 4) Are they making an estimate or prediction?

An estimate should be based on real numbers and calculations, and should account for many scenarios.

**Strategy:** Find the data, calculations, and assumptions they used to make the estimate. Did they assume best or worst case? Did they include what *you* care about most?

> *"Officials estimate that a typical resident doesn't eat more than five fish from the stream per year."*

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### 5) Is there a comparison to a maximum or minimum?

The claim might compare one or more measured numbers to a fixed maximum or minimum - like a legal limit, or a promised benefit. Look for language like "did not exceed" or "will be at least".

**Strategy:** Are they using the most appropriate limit or standard for comparison? Even if there is a limit, does that guarantee safety? If they're making a promise about the future, how did they make their calculations? Look out especially for "typical" numbers (see #3 above)... sometimes an average will not exceed a legal limit, but individual data points will.

*There will be no more than 150 truck trips to the landfill per month.*

### 6) Is there a claim about an increase or decrease?

They may claim that "X" will increase or decrease with time.

**Strategy:** Ask, "Compared to what?" They might choose a number that makes their plan look good. They may say an increase is because of something they did, but maybe it would have happened anyway. If it's a claim about the future, find out what is and is not included in their forecast.

*The new factory complex will add 3 acres of new open space and $1 million in tax revenue for the city.*

Is that "open space" mostly parking lots? Does the increase in revenue account for a decrease in home values next to a dirty factory? Or maybe the increase in tax revenues is just from population growth, and has nothing to do with the factory.

### 7) What else is missing?

There may be other things about the claim that you will need to know before you challenge it. The numbers may be...

**Unspecific**: Someone knows the number, it's just not shown.
**Ambiguous**: It's not clear anyone knows the number.
**Incomplete**: The number includes some things but not others.
**Subjective**: Words like *reasonable*, *feasible*, and *acceptable*.

**Strategy:** Without any numbers, you can't know if the claim is true, or if it will have an impact in the community. Push for precise numbers, or for a range, like "between X and Y".

*Pesticide use did not cause any increase in illness.*

*We will give low-interest loans and incentives to weatherize homes."*

*The risk of any kind of leak from the landfill is negligible.*

### 8) Now, list them all!

Look at all the possible challenges and missing information you've identified. Write it all down. Decide which challenge will be the easiest and most useful to you.