TVR/VIL/009
15 January 2014

Shri Arvind Kumar
Advisor – Network, Spectrum and Licensing
The Telecom Regulatory Authority of India
Mahanagar Door Sanchar Bhawan
Jawahar Lal Nehru Marg (Old Minto Road)
New Delhi-110002

Dear Sir,

VIL Response to TRAI Consultation paper on Reserve Price for the Auction of Spectrum in the 800 MHz Band

Please find enclosed our response to the TRAI Consultation paper on Reserve Price for the Auction of Spectrum in the 800 MHz Band.

In summary, while we continue to support and endorse the auction of 800MHz as E-GSM, we submit that in the event that it is auctioned as conventional 800MHz,

- All available spectrum should be put to auction
- The block size may be 1.25MHz for existing operators. New Entrants should be required to take at least 5MHz.
- As 900MHz and 800MHz are similar assets, the valuation arrived at for 900MHz should be applied to 800MHz for the 3 metros and the same approach as was used in the case of valuation of 900MHz should be extended to other service areas.
- Reserve price should be set at 80% of the valuation even though this adjustment factor was not adopted by Government in the Notice Inviting Applications.

As and when the band is reassigned for E-GSM, the value of the reapportioned spectrum should be the same as the remaining spectrum in the 900MHz band

Our detailed response is given in Annexure-1.

We hope that our submissions will merit your kind consideration and support.

Kind regards,

Sincerely yours,

T. V. Ramachandran
Resident Director
Regulatory Affairs and Government Relations

Copy to : **Dr. Rahul Khullar, Chairman, TRAI**
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: **Shri R. K. Arnold, Member, TRAI**
: **Shri Rajeev Agrawal, Secretary, TRAI**
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Annexure - 1

VIL Response to TRAI Consultation Paper on Reserve Price for the Auction of Spectrum in the 800 MHz Band

Summary

In its previous exercise, TRAI set the reserve price of spectrum by reference to the 'value' of that spectrum. Spectrum in the 800MHz is, and will continue to be, used to provide services which compete directly with those supplied with other bands. The value of the 800MHz can be estimated by reference to the value of spectrum in these other bands. More particularly, given the similarity their propagation characteristics, the value of 800MHz is best approximated by considering the value of 900MHz. Put simply, they are similar assets. TRAI has already completed much of this work in its exercise to set the reserve prices in the February auction: it has actual values for the three metros and a methodology that it can apply to the remaining circles.

We recommend that the reserve price for 800MHz at 80% of the value of spectrum in the 900MHz band i.e., in line with its recommendation to Government and its desire allow a cushion in the level of the reserve price to see price discovery in the auction. This method will ensure a consistent approach between the auctions, but allow the auctions to reveal the *actual* relative values of the two bands. Furthermore, it will cap any loss to the Exchequer from delays in reassigning the 800MHz to E-GSM.

Estimating the value of 800MHz spectrum

In its recommendations to the Department of Telecommunications on the setting of reserve prices for the forthcoming auction[1] TRAI has advocated a 'value based' approach. The Authority uses a variety of methods to derive estimates of the value of 1800MHz spectrum; from these it derives a single estimate of value (by LSA) by taking a simple average of its estimates. The reserve price is set as a percentage of this single estimate to allow price discovery in the auction and reduce the risk of having unsold spectrum. It is apparent from the consultation that TRAI intends to follow a similar approach to setting the reserve price of 800MHz spectrum. The question then is: how should the value of 800MHz spectrum be estimated?

In our response to the previous consultation we noted that the number of CDMA users is declining by 28% year-on-year; minutes of use are shrinking by an average of 10% year-on-year and there is an apparent the lack of interest in acquiring CDMA spectrum (nearly 70% unsold in the previous auction with the remainder going to a distressed bidder). The current consultation notes that most CDMA operators have started reserving a major proportion of their allocation for deploying EVDO technology for high speed wireless data services and that the spectrum in this band can also be used for LTE (850) and UMTS (900). Indeed, given the decline in the use of the CDMA band, TRAI has recommended that the feasibility of adoption of E-GSM in this

[1] Recommendations on Valuation and Reserve Price of Spectrum 9th September 2013.

band should be explored and the auction in this band should not be held presently.[2] We continue to support TRAI's previous recommendation.

In its letter to the Authority (quoted in paragraph 1.11 of the consultation) the DoT rejects delaying the auction of 800MHz but states that:

> *With regard to E-GSM band, it has been viewed that apportioning spectrum in the 800 MHz band for E-GSM, 10 MHz of spectrum would remain unutilized. Besides, the E-GSM band requires vacation of spectrum by Defence services to ensure availability of adequate spectrum which is likely to take time and keeping spectrum in the 800 MHz band unsold would result in foregone revenues for Government. It would be appropriate to put the spectrum to auction and allow market forces to determine the appropriate technology solution using the liberalised spectrum. Therefore, it has been decided that 800 MHz band will be put to auction in the next round of auction of spectrum.*

The DoT therefore does not reject the apportioning of the band for E-GSM, it points out that this will take time and that it does not want spectrum left idle in the meantime. It proposes that 'market forces' determine the appropriate technology solution. The auction of the 800MHz band, before it is reshuffled for E-GSM, will permit any existing operators who so desire to purchase additional spectrum (and so reduce the amount of spectrum lying idle) but this will not prevent the later adoption of this band for E-GSM.

The currently available information allows us to make a number of inferences about the 800MHz band:

- If spectrum is purchased in an 800MHz band auction it will be used to provide data services. These services will compete with other technologies in different bands in the manner summarised in the table below. Please see attached in the appendix a sample advertisement from MTS which claims that its data performance is superior to 3G.

Technology deployed in the 800MHz band	**Competing Technologies / Bands**
EVDO	GPRS 900/1800, UMTS900, 3G 2100
LTE850	3G, UMTS900, LTE1800

[2] In our response to the previous consultation we estimated that, with the co-operation of the PSUs and the Defense Ministry and TTSL/TTML's relinquishing of spectrum in excess of 3.75MHz in the metros and 2.5MHz elsewhere, just over 190MHz of E-GSM spectrum can be cleared (5MHz in all circles and 10MHz in eleven circles). These figures differ from TRAI's in the current consultation because it assumes that BSNL retains 1.25MHz for its R-DEL subscribers. We see no reason why this cannot be achieved within a period of a few years. If necessary, we would support payments to the current holders of spectrum to compensate for any reasonable costs incurred in clearing spectrum.

- Over time, the spectrum in the 800MHz band is likely to be reshuffled, and the vacant spectrum will form part of the E-GSM band. On the Authority's calculations 5MHz or more of E-GSM spectrum could be available in 20 LSAs.

TRAI notes in its recommendations on reserve prices:

> *The demand for spectrum as a natural resource is not a direct one like for most commodities. It is derived from the demand for final goods and services that are produced using spectrum as an input..... In the case of TSPs, it is telecom consumers who, through their demand for telecommunication services, create a demand for spectrum. The greater the demand for telecom services, the greater will be the demand for spectrum by the TSPs. The demand for spectrum is a derived demand. Valuation of spectrum is determined to a large extent by its demand which, in turn, depends on the willingness and ability to pay of a large number of spectrum users or TSPs who use it as an input in the production of telecom services.*

In other words: spectrum has value because of the services that can be produced by using it with it as an input; demand for spectrum is derived from the demand for the services that it produces. The value of spectrum in any band, in the absence of direct market data, can be estimated by assessing the value of spectrum on which substitute services are produced. If we can estimate the value of spectrum used to produce services which compete with those produced using 800MHz spectrum (see the previous table) then we can estimate the value of the latter. Given the similarity of propagation their propagation characteristics the value of 800MHz is best approximated by considering the value of 900MHz spectrum.[3] Put simply, 900MHz is a similar asset to 800MHz spectrum.

TRAI has already gone through an exercise to estimate the value of 900MHz spectrum in the three metros and it has the methodology in place to estimate its value for the remaining circles. We recommend that these estimates are used to set the reserve price of 800MHz spectrum (after a suitable discount – see later). We note that the estimates of the value of 900MHz spectrum already embody the results from the November 2012 auction (via an econometric analysis) together with an assessment of the opportunity cost of spectrum[4] and has been 'sense checked' against the sale price of spectrum in other countries. We see no reason to repeat this analysis for the current exercise. Our approach is closely aligned to TRAI's statement in its recent recommendations: "[t]his is a valuation methodology in which the value of spectrum is calculated based on empirical data on the prices of actual transactions for ***the same or similar assets*** sold in the past. In combination with such comparative estimates, it is also possible to undertake direct valuation of spectrum." (see paragraph 3.49 – our emphasis)

Although the timing of the auction of 800MHz is uncertain, it is likely to be the case that actual market data is available on the price of 900MHz spectrum; at least for three LSAs. We do not recommend that this data is used as a basis to set the reserve price of 800MHz spectrum. Instead, the market should be allowed to determine the relative value of the two spectrum bands. For example, the bidders in the auctions will form their own views about the maturity and cost of the eco-system for LTE 850MHz, the uncertainty on the timing

[3] In its recommendations, TRAI rejected using the price of spectrum from the 3G auction to estimate the value of 1800MHz because the circumstances of the industry had changed markedly since 2010; we supported this view.
[4] As a first approximation we may assume that the opportunity cost of the 800MHz and 900MHz bands is similar.

of E-GSM and the greater efficiency of 800MHz versus 900MHz. Our approach allows the market to determine the exact relative values of the two spectrum types.

It should be uncontentious that, as and when the band is reassigned for E-GSM, the value of the reapportioned spectrum is *the same as the remaining spectrum* in the 900MHz band. Therefore, setting the reserve price of 800MHz with reference to the value of 900MHz ensures that the amount of revenue forgone by the Government for the delay in reassigning the band is minimised. In other words, the opportunity cost of auctioning the 800MHz band before it is reassigned for E-GSM is the revenue forgone in not selling it as GSM spectrum now;[5] equating the reserve prices for both bands caps any loss to the Exchequer to the difference between the final selling price of the two bands (assuming the 900MHz sells for more than 800MHz).

Moreover, if TRAI adopts a principle of setting a reserve price with reference to the value of the spectrum being sold it should ensure that its estimates of this value reflect the spectrum's highest value use. To do otherwise risks the type of collusive behavior noted by TRAI in its previous recommendations: *"[a] stronger bidder in an ascending auction has its choice between either colluding to end the auction quickly at a lower price, or forcing the price up to drive out weaker bidders. The lower the reserve price, the more attractive the first option."*

Setting the reserve prices for 800MHz spectrum:

To enable competitive bidding and price discovery in the auction it is important that the reserve price is set below the valuation of the marginal bidder[6]. As TRAI noted in the previous consultation:

> *the computation of an optimal reserve price requires information on the range of possible valuations of the spectrum and the probability of each valuation being realized. It is difficult, if not impossible, to calculate the complete range of all possible valuations. However, some estimates of valuation of spectrum can certainly be attempted. From some estimates of valuation, it is possible to work out an average valuation as the simple mean of the estimates at hand. As far as the reserve price for the auction is considered, the average valuation itself could be taken as the reserve price. The drawback of this method is that there is no way of knowing whether the theoretical optimum, i.e. the mid-point of a complete range of valuations has been achieved. The danger is that it may end up fixing the reserve price on the higher side.* (paragraph 3.58 of the Recommendation on Valuation and Reserve Price of Spectrum).

The reserve price of spectrum is set at a discount to the estimated value. We recommend that TRAI adopts the 80% factor in setting the reserve price; even though this adjustment factor was not adopted by Government in the Notice Inviting Applications.

[5] Similarly, we see no reason why TSPs who purchase spectrum in the 800MHz auction should be able to make significant windfall gains from trading spectrum in this band when it is reassigned as E-GSM.

[6] In any auction, the market price is revealed when the marginal bidder either reduces its demand or leaves the auction. Put simply, in each LSA, there will be as many valuations of spectrum as there are operators, but there is only one market price for spectrum.

Answers to specific questions:

Q.1. What should be the quantum of spectrum in the 800 MHz band that should be put up for auction?

As a matter of principle spectrum should not be hoarded by Government or the TSPs.

The spectrum held by CDMA operators, in excess of the Subscriber link criteria of 17 January 2008, may be taken back and put to auction.

We support auctioning the spectrum relinquished by TTSL; that retrieved from the TSPs and the remaining unused spectrum.

Q.2. What should be the block size in the 800 MHz band?

The block size may be kept at 1.25MHz for existing operators. New operators should be required to purchase a minimum of 5MHz.

Q.3. Should the value of 800 MHz spectrum be derived on the basis of the value of 1800 MHz spectrum using technical efficiency factors?

The value of 800MHz should be derived on the basis of the value of 900MHz as explained above.

Q.4. Is there any case for application of a lower efficiency factor (1.3) over the valuation of 1800 MHz spectrum, for determining the valuation of 800 MHz, as was done in the previous auction? If yes, give detailed reasons for the same.

No. For the valuation of 800MHz, TRAI should extend the methodology that it used to estimate the value of 900MHz for the metros to the remaining LSAs.

Existing operators who purchase spectrum may request that the band is reshuffled to enable them to hold contiguous spectrum. If done, this exercise should be carried out to accommodate the future reassignment of the band for E-GSM.

Q.5. Should the value to be paid for 800 MHz spectrum be based upon the potential growth in data services? If yes, please state whether you agree with the assumptions made.

Yes. This is already embodied in the estimates of the value of 900MHz.

Q.6. Should the value of spectrum in the 800 MHz band be assessed on the basis of producer surplus on account of additional spectrum? If you are in the favour of this method, please furnish the detailed calculations and relevant data along with results.

No specific calculations are required. Estimates of the opportunity cost of 900MHz are already embodied in the reserve price for this band. At a first order of approximation these should also be applicable to the 800MHz band.

Q.7. Should the value of spectrum in the LSAs in India for 800 MHz be determined by utilizing the data on international prices? What other variables do you suggest for arriving at robust value estimates

using the multiple regression approach? Is there any alternate approach for valuation of spectrum in 800 MHz using the data on international auctions?

TRAI's estimate of the value of 1800MHz has already been sense-checked against international data; this is sufficient for the current exercise.

Q.8. Apart from the approaches discussed in the paper, is there any alternate approach for valuation of spectrum in 800 MHz that you would suggest? Please support your answer with detailed data and methodology

Please see the first section of our response. The reserve price of 800MHz should be set with reference to the estimated value of 900MHz spectrum.

Q.9. What should be the ratio adopted between the reserve price for the auction and the valuation of the spectrum? Would it be optimal to fix reserve price equal to valuation of spectrum?

The reserve price of 800MHz should be set at 80% of the estimated value of 900MHz in line with TRAI's earlier recommendation.

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